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This Issue

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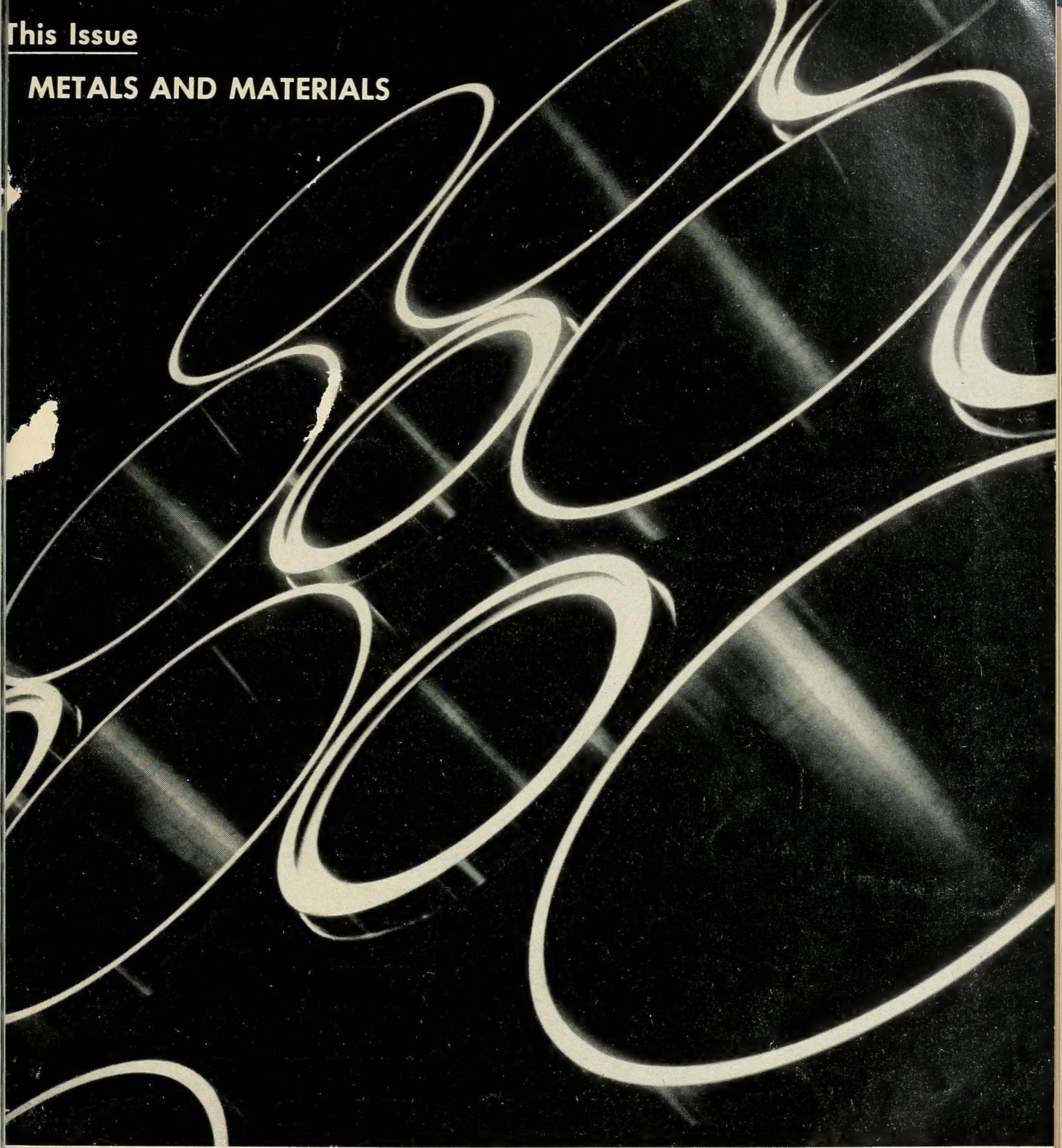

missiles and rockets

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MAGAZINE OF WORLD ASTRONAUTICS

MARCH 1958

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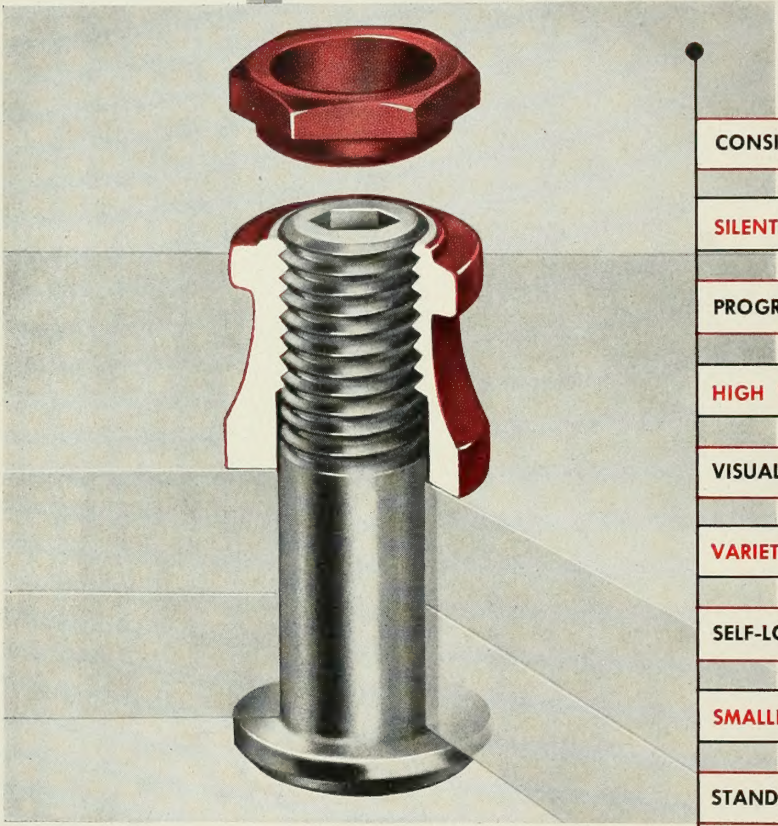

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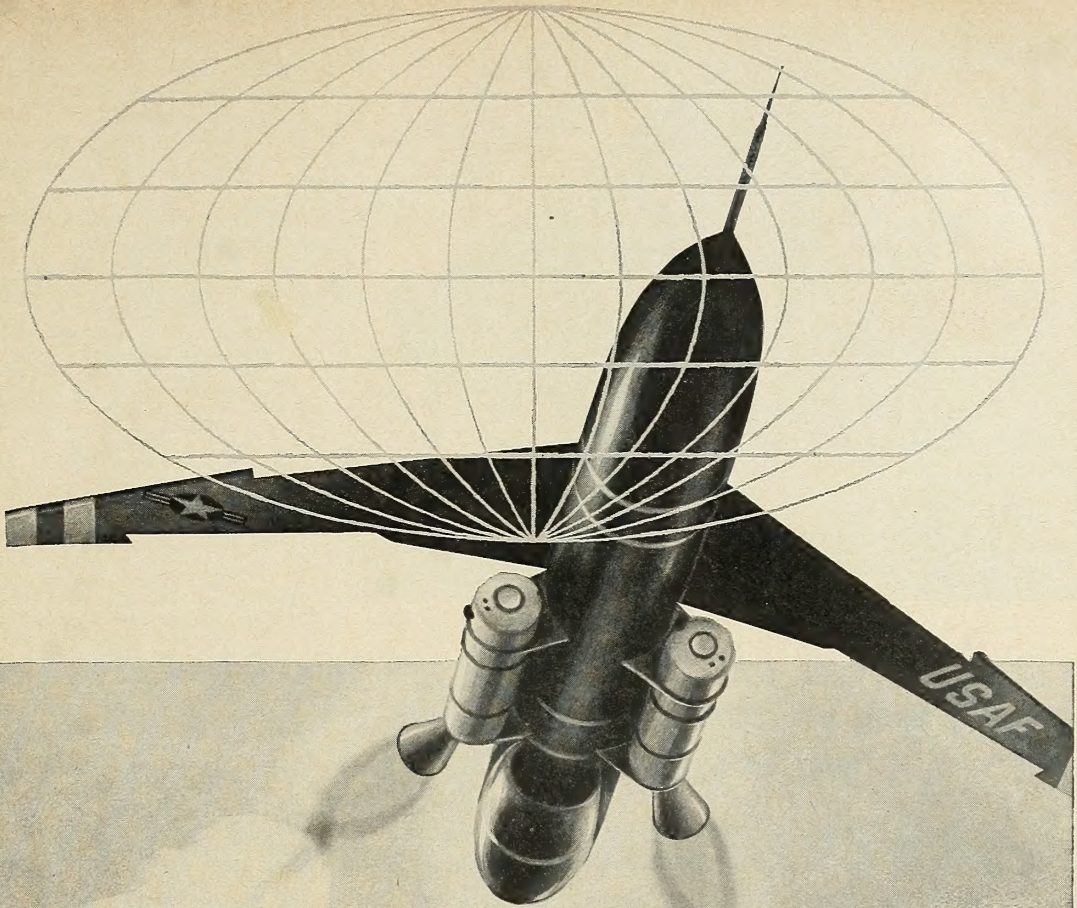

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New propellants used by today's—and the future's—missiles and pilotless bombers pose awesome problems.

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March, 1958 Volume III, No. 3

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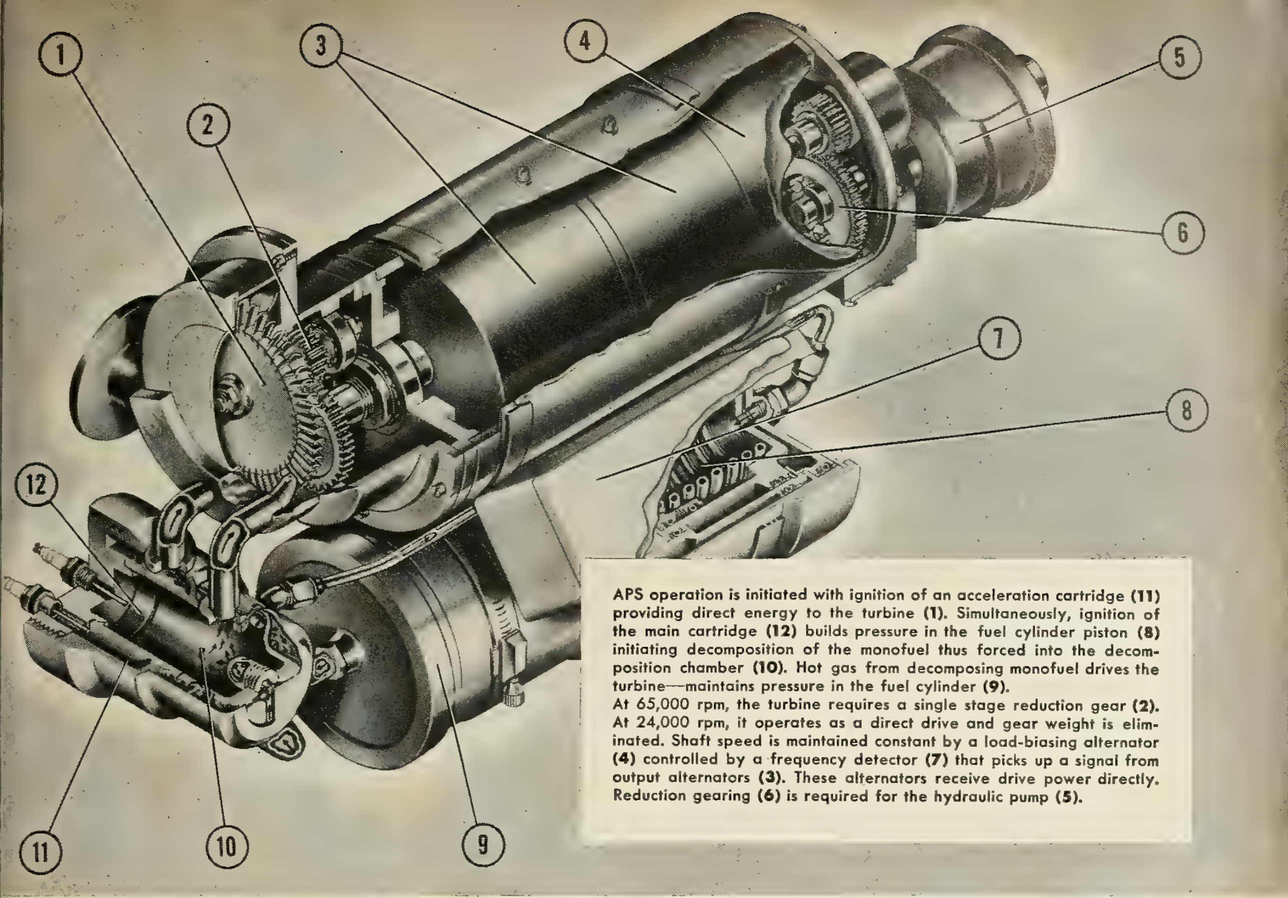

APS operation is initiated with ignition of an acceleration cartridge (11) providing direct energy to the turbine (1). Simultaneously, ignition of the main cartridge (12) builds pressure in the fuel cylinder piston (8) initiating decomposition of the monofuel thus forced into the decomposition chamber (10). Hot gas from decomposing monofuel drives the turbine—maintains pressure in the fuel cylinder (9).

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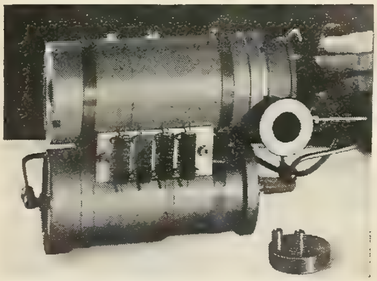

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missiles and rockets vol. 3 no. 3

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cover picture:

Pattern for tomorrow! Caught in the sunlight, these stacked Nike *nozzles were photographed by m/r Associate Editor Seabrook Hull at Diversey Engineering Co. in Chicago. They symbolize much that is peculiar to missiles. Starting as heavy steel forgings, they have been machined down to less than one-half of their original forged weight in just a few minutes. Other missile metals run the gamut from aluminum and titanium, through the stainless steels and on to nickel-cobalt alloys, columbium and molybdenum. It is missile materials such as these that this issue of m/r emphasizes.*

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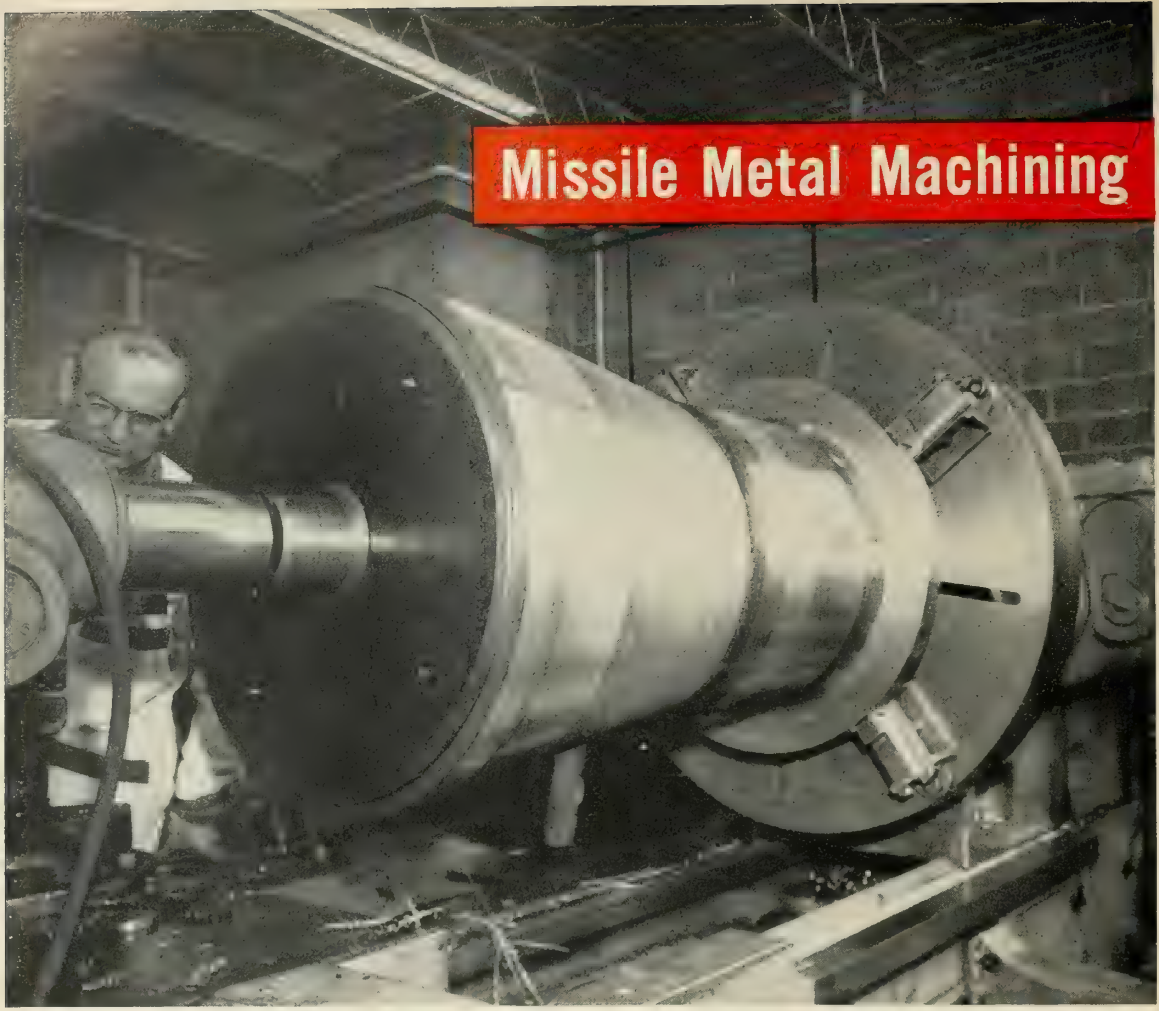

Big Nozzles for Big Rockets

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Why all the Hemming and Hawing?

Five months have passed since *Sputnik* I. Yet the United States still doesn't have a space flight program. Bureaucratic complacency continues to hamper our missile and rocket efforts.

The basic problem appears to be lack of leadership at the top. No high-ranking administration official has spelled out what this country will attempt in the fields of missiles and astronautics.

Perhaps the main problem is that our political leaders cannot yet visualize the implications, the rewards and the value of space flight. Furthermore, they are still arguing whether space flight should be conducted under civilian or military auspices. Undoubtedly, a full-fledged attempt to explore and conquer space must be considered as a joint scientific-military venture.

Numerous space flight proposals from individuals and from industry have been submitted to the three services. Even our Vice President has been pleading with the National Security Council to rush approval of a moon rocket. The Vice President has reviewed such plans with Douglas Aircraft scientists, who are building the *Thor* missile. The Air Force hopes to use the *Thor* as the first stage for a moon rocket. But no one has yet attempted to coordinate all these proposals. No one has been authorized to do so.

Let us keep in mind what the Russians think about astronautics. They are convinced that apart from its purely scientific interest, space travel probably will be of practical value, although at this stage, they say, it is difficult to specify in what way. They point to the fact that the planets and their satellites are an inexhaustible source of mineral wealth which must be studied and utilized for the well-being of mankind.

Red officials say the Soviets will build interplanetary stations and spaceships in order to uncover the secrets of the universe and extend the domain in which human reason reigns over the elements.

We do not recall ever having heard similar remarks from any Administration official in this country. The lack of enthusiasm has been discouraging, not only to the American people, but to the entire Free World. Our efforts have been small, aimless.

Interservice rivalry is worse than ever. It has been thrown wide open again by Missile Czar William Holaday. All three services have been invited by Holaday to submit their missile proposals. This invitation automatically cancels past agreements to divide up missile development.

As a result, the Army has submitted plans to build an intercontinental ballistic missile, in direct competition with the Air Force's 5000-mile *Atlas* and *Titan* missiles. The invitation immediately spurred the Air Force to submit a proposal to build another ICBM—a solid-propellant vehicle to replace the programmed *Atlas* and *Titan*.

The ironic symbol of complacency in our bewildered astronautics efforts is the also-ran success of the Army-launched *Explorer* satellite. This belated achievement was proof that we could have launched a satellite a long time ago. Unquestionably, we have the technological capability to launch other, more sophisticated space vehicles.

What are we waiting for? The Administration must take the blame for the lack of planning and the failure to get a national space flight program off the ground. If we wait much longer the result could be fatal to us as a nation.

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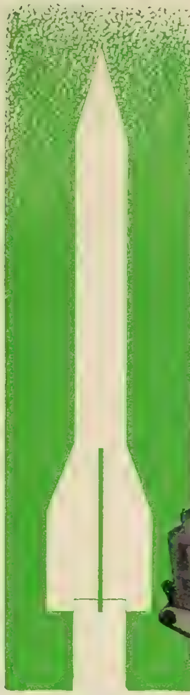

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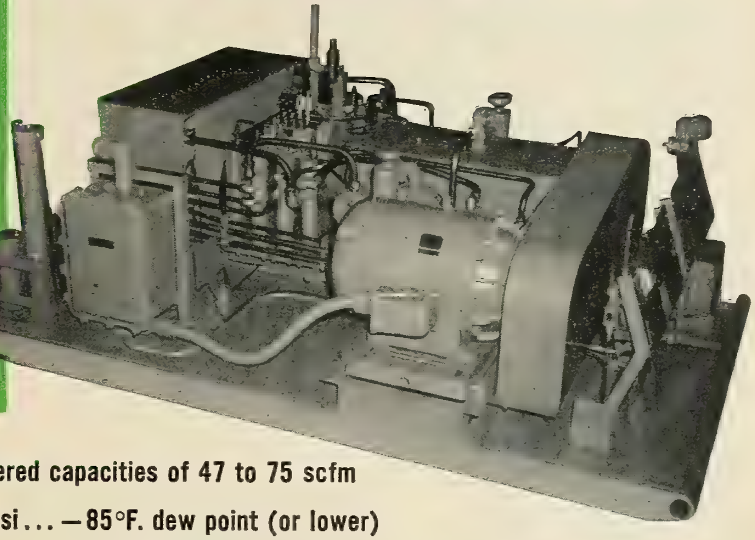

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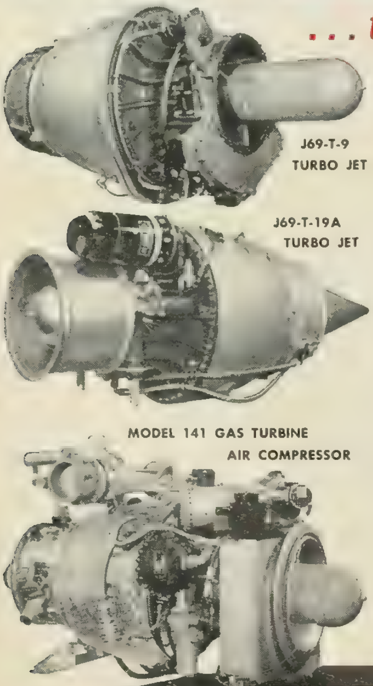

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1958 Nuclear Congress and Atomic Industry Trade Show, International Amphitheater, Chicago, Ill., March 16-22.

ARS-ASME Joint Aviation Conference, Dallas, Tex., March 17-20.

First Interservice and Industry Symposium on Guided Missiles Training Equipment (limited to those with secret clearance), Naval Ordnance Laboratory, Silver Spring, Md., March 18-19.

USAF Cambridge Research Center, Conference on Extremely High Temperatures (over 30,000°K), L. G. Hanscom Field, Bedford, Mass., March 18-19.

IRE, National Convention and Radio Engineering Show, Waldorf-Astoria Hotel, New York Coliseum, New York, N.Y., March 24-27.

AFOSR 2nd Annual Astronautics Symposium, Shirley Savoy Hotel, Denver, Colo., April 28-30.

APRIL

ASME Division of Instruments and Regulators Conference, University of Delaware, Newark, Del., April 1-3.

Eighth International Symposium, Electronic Wave Guides, sponsored by Microwave Research Institute of Brooklyn Polytechnic Institute, Engineering Societies Building, New York, N.Y., April 8-10.

ASME Maintenance and Plant Engineering Conference, Penn-Sheraton Hotel, Pittsburgh, Pa., April 14-15.

ASME Design Engineering Conference, International Amphitheater, Chicago, Ill., April 14-17.

ASME and AWS Engineering Division Joint Conference, Statler Hotel, St. Louis, Mo., April 15-17.

Institute of Environmental Engineers, Second Annual Technical Meeting, Hotel New Yorker, New York, N.Y., April 17-20.

AIEE, IRE, EIA, WCEMA Electronic Components Conference, Reliable Application of Component Parts, Ambassador Hotel, Los Angeles, Calif., April 22-24.

MAY

American Society of Tool Engineers, Second Annual Technical Meeting, New York, N.Y., May 1-8.

National Flight Test Instrumentation Symposium, Instrument Society of America, Park Sheraton Hotel, New York, N.Y., May 4-7.

Professional Group on Microwave Theory and Techniques, National Symposium, Stanford University, Palo Alto, Calif., May 5-7.

IRE, ACM, AIEE, Western Joint Computer Conference, Los Angeles, May 6-9.

Armed Forces Day "Open House" at most U.S. Military Bases. Observances May 10 thru May 18 in various cities.

JUNE

IAS, AIEE, ISA, National Telemetering Conference, Lord Baltimore Hotel, Baltimore, Md., June 2-4.

IRE Second National Symposium on Production Techniques, Hotel New Yorker, New York, N.Y., June 5-6.

American Rocket Society, Semiannual Meeting, Hotel Statler, Los Angeles, Calif., June 8-11.

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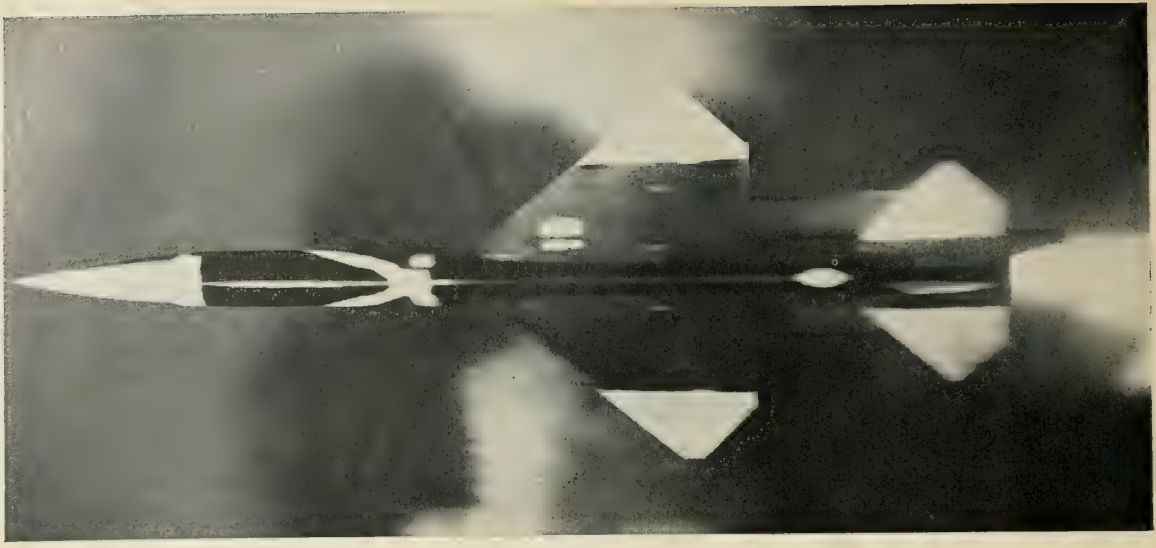

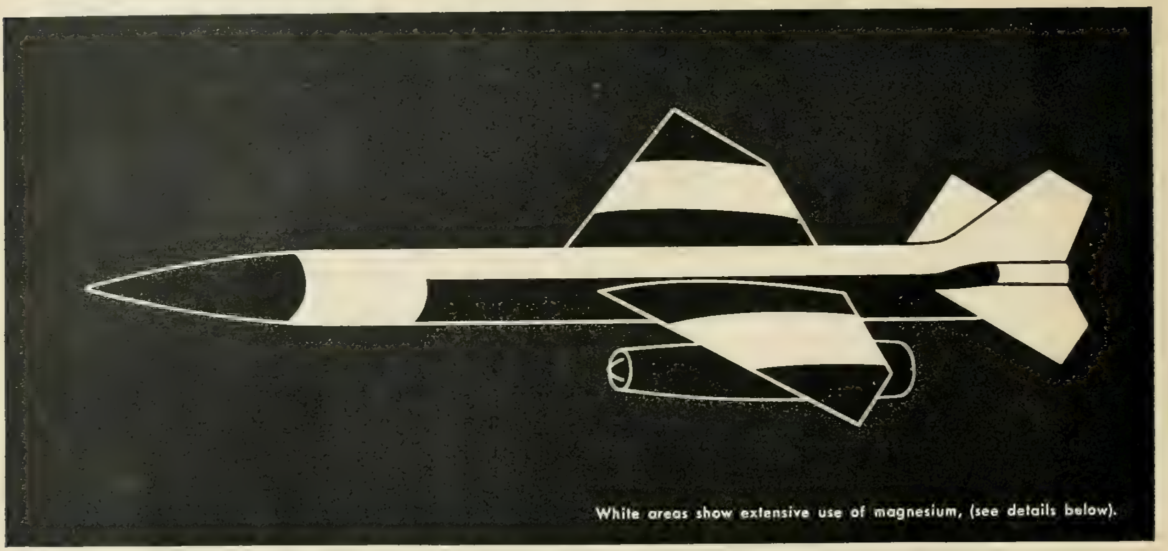

White areas show extensive use of magnesium, (see details below).

HOW ELEVATED-TEMPERATURE MAGNESIUM ALLOYS HELP BOMARC KEEP FIGHTING WEIGHT

Approximately 230 lbs. of magnesium is used in the airframe of the Bomarc, powerful surface-to-air missile. And for good reason: In each case, the specific application called for light weight and retention of strength, rigidity and other properties at elevated temperatures. The logical choice was sheet, extrusions or castings of elevated-temperature magnesium alloys.

EXAMPLES:

BODY. The body skin and doors of both nose and aft sections utilize 103 lbs. of HK31A sheet and castings. Resultant weight savings were 23 lbs., including a net reduction of 6 lbs. by using a magnesium casting for a door frame structure.

WING, FIN AND TAIL. 111 lbs. of HK31A sheet were used in the wing, elevators and elevator stubs, fin and rudder. All leading and trailing edges of control surfaces for wings and fin are HM31XA extrusions. Here another 8 lbs. were saved by using an elevated-temperature magnesium alloy.

These are but a few instances of how precious weight was saved in the Bomarc. For more information about the use of magnesium alloys in aircraft, rockets and missiles, contact the nearest Dow sales office or write directly to us. THE DOW CHEMICAL COMPANY, Midland, Michigan, Department MA 1407L.

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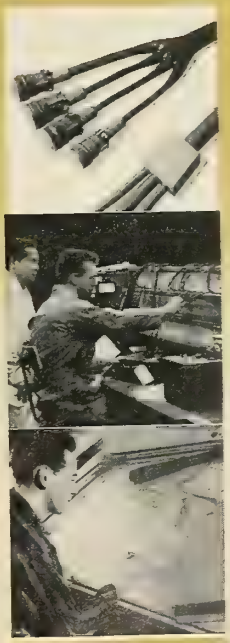

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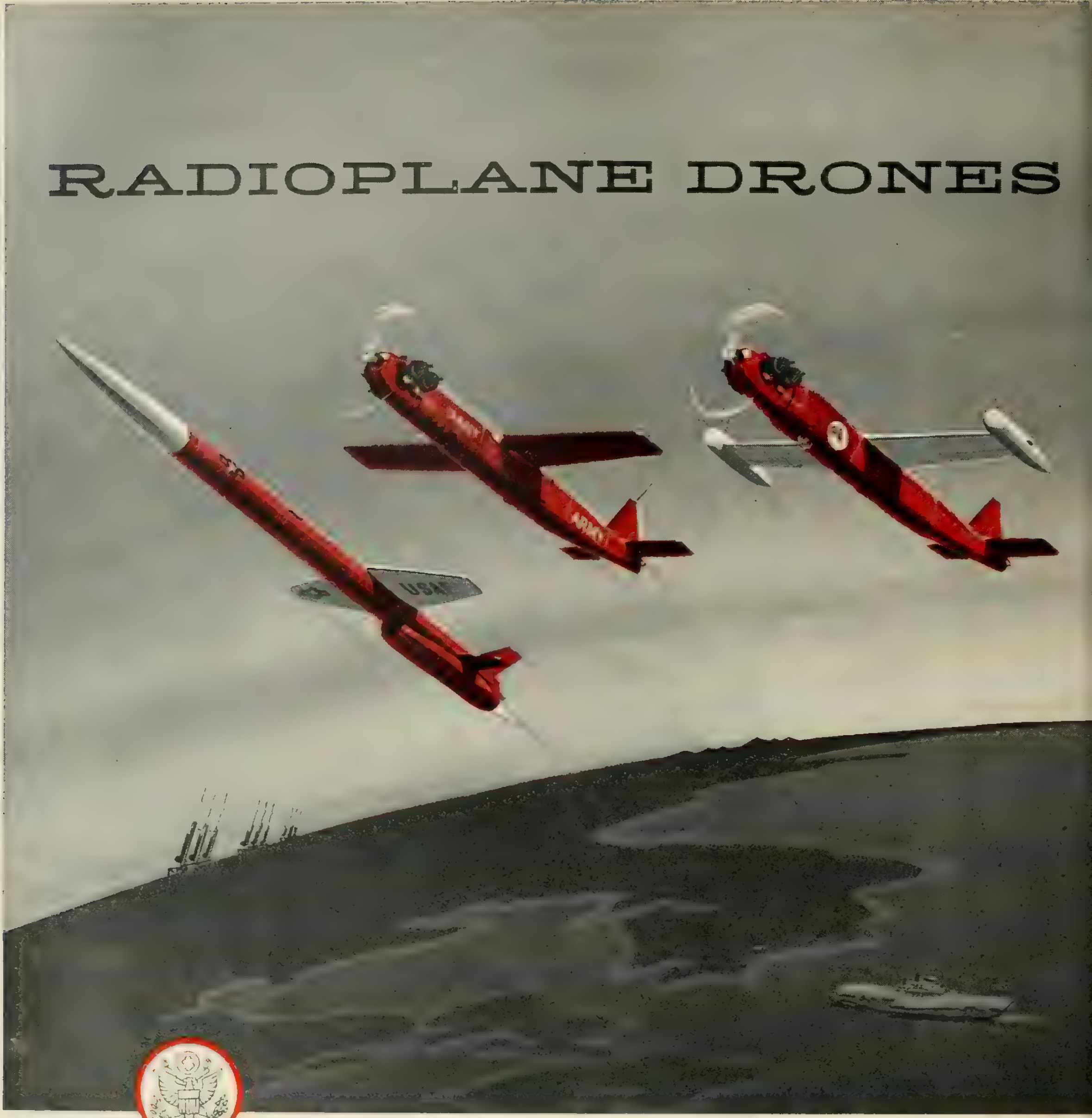
RADIOPLANE DRONES



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WHAT IS RADIOPLANE?

Radioplane, a division of Northrop Aircraft, Inc., has been producing drones since 1938. And since 1938 Radioplane has concentrated its efforts almost entirely in the drone field, having produced and delivered tens of thousands of drones to all of the United States Armed Forces for defense training.

WHAT IS A RADIOPLANE DRONE?

A Radioplane drone is an unmanned aircraft designed to be flown by remote or self-contained control to perform a specific military mission at the lowest cost and with the highest efficiency. Every drone produced by Radioplane is developed to meet particular defense requirements which cannot be fulfilled by man-carrying aircraft.

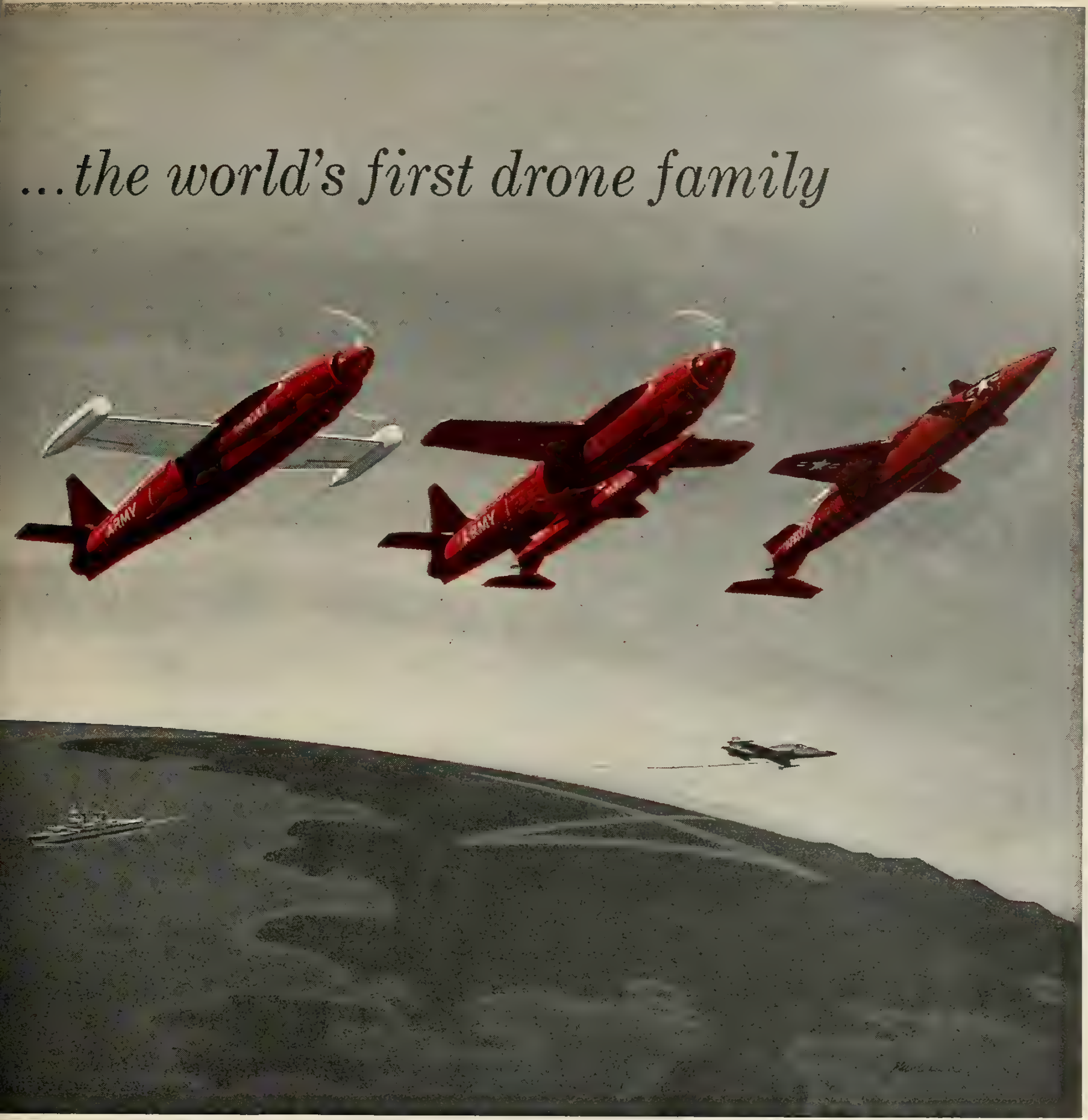
WHY A DRONE FAMILY?

Drones are required to serve as targets for the *evaluation* of modern weapons, in the *training* of weapon crews, and for aerial *surveillance*. Each of these vital areas requires a special drone application. For this reason, Radioplane has developed this family of drones (left to right):

XQ-4A . . . Evolving from the supersonic XQ-4, the Air Force XQ-4A is a highly sophisticated target drone designed to cope with the exacting and comprehensive requirements of evaluating the kill-ability of modern weapon systems.

OQ-19 TYPE . . . Standard radio controlled aerial target for all the military services, the tough, reliable and versatile OQ-19 drone is used all over the world as an economical training target.

SD-1 . . . Without endangering a pilot's life, the U.S. Army Signal Corps' SD-1 can be flown by remote control on photo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reconnaissance missions, returning within minutes with a photographic report of enemy activities.

RP-77D . . . Powered by Boeing's rugged 502-10 turboprop engine, the RP-77D provides high speed, and both high and low altitude performance at low cost for the training of gun and missile crews.

RP-77DL . . . The RP-77DL will carry the RP-76 target aloft for launch at altitude over the Army's Nike ranges, thus eliminating the need for diverting a manned plane and crew into a workhorse job.

RP-76 . . . (Shown attached to the RP-77DL.) The rocket powered RP-76 has very high altitude capabilities for training the Army's ground-to-air missile crews against fast, realistic targets.

XKD4R-1 . . . Designed for U.S. Navy fleet target air-to-air and surface-to-air weapon training, the XKD4R-1 rocket drone flies a pre-set course by programmed flight control.

* * *

Radioplane has been selected by the U.S. Army to provide complete *contractor operated flight services* at White Sands Proving Grounds, New Mexico. This service includes furnishing aerial targets, ground support equipment, and operational, training, and maintenance personnel.

For detailed information write Customer Relations,
Radioplane, 8000 Woodley Avenue, Van Nuys, California

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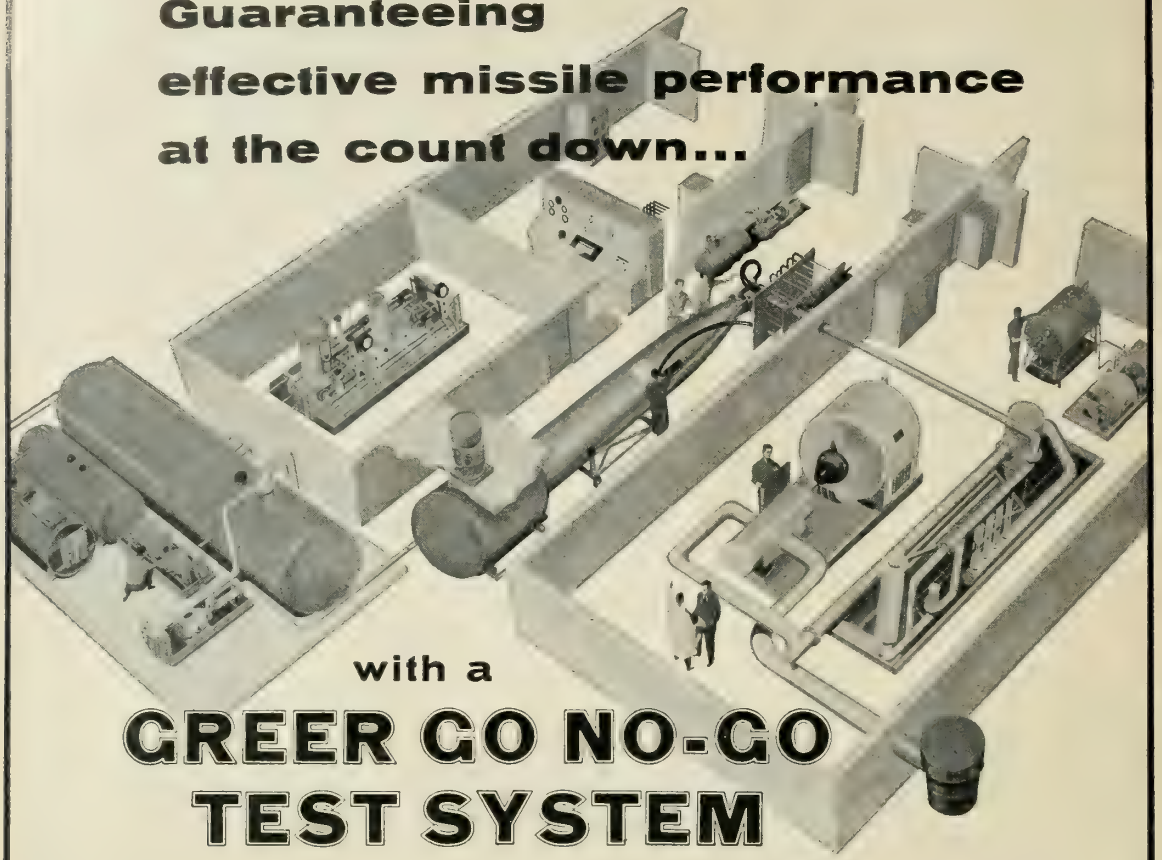

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letters

Credit to ABMA

To the Editor:

We were very pleased with the inclusion of the John Jagy article in your February issue. However, probably due to editorial space you condensed the introduction of the article and thereby made an error which I feel should be corrected.

In the introduction of the article as we sent it to you, we pointed out that the air bearing gyro was developed by the Army Ballistic Missile Agency. In your condensation of the introduction you left this information out and consequently gave the impression that we are claiming to have developed this very unusual instrument.

I feel that it would be only right for you to carry a correction . . . to give full credit to the Army Ballistic Missile Agency for their work and particularly to Dr. Walter Haeusserman, Mr Fritz Mueller, Mr. Henry Rothe and Mr. Wilhelm Angele, who headed up this splendid work.

I am sure that it is your intention to give full credit where credit is due to all who are responsible for making valuable contributions to America's missile effort.

S. H. McAloney
Director of Public Relations
Ford Instrument Co.
Div. Sperry Rand Corp.
31-10 Thomson Ave.
Long Island City 1, N.Y.

Done.—Ed.

Wise Men

To the Editor:

Your editorial in your December issue, "Let's Listen to the Wise Men," stated that: "Reports were written by Dr. Louis Ridenour urging a divorcement of research from engineering management." I would appreciate it very much if your office could send me complete reference to these reports. They should have application in management of R&D on range instrumentation.

Dr. Fred Hanson
Scientific Advisor
Integrated Range Mission Staff
White Sands Proving Ground
P. O. Box 3
Mesilla Park, N.M.

Contact the Command Historian, ARDC, Andrews AFB, for copies of reports by the Ridenour Committee, which led to the establishment of ARDC.—Ed.

Space-for-Peace Plan

To the Editor:

In a recent issue of m/r you mentioned my proposal for an International Astrophysical Decade. Since the date and place of submission of this proposal was not mentioned, I wish to add this information here, together with a few comments.

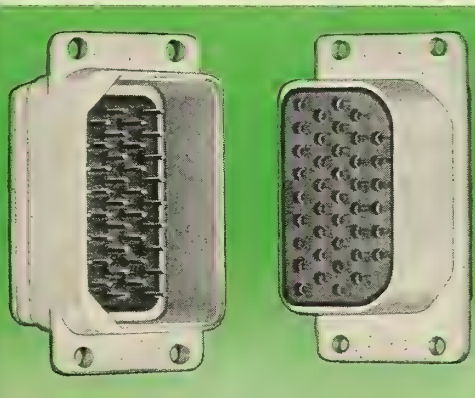
The proposal was part of a paper entitled "Instrumented Comets—Astronautics of Solar and Planetary Probes." It dealt with the analysis of lunar and heliocentric probes, their flight profiles, characteristics and mission assignments.

The paper was presented at the Eighth International Astronautical Congress in Barcelona, October 1957, and was submitted to the International Papers Committee long before the first Russian satellite appeared in the sky. In studying the practical and organizational problems of inner solar-systems research by artificial comets and its remoteness from immediate military significance, it appears to me that an international effort is the most attractive approach, similar to the IGY in spirit and purpose, but to be extended over a longer period of time in view of the duration of the missions and the cost of the experiments involved.

I also see in such a project a unique opportunity for astronautics to foster international cooperation and gradual development of a planetary perspective in the international public, a feeling which must become the foundation of future space operations if they are to be peaceful and constructive.

In my opinion, the Russian Government—much as it has exploited propagandistically its great achievement—has missed here a historically unique opportunity of genuine service to mankind—namely, to invite international astronautic cooperation of the type of the International Astrophysical Decade or comparable projects, because I am convinced that this is what most people on this earth would really welcome.

Instead, the Russian Government has called for a "race into space." The adjective "peaceful" was used by Mr. Khrushchev. However, the dangerous implication of the "race" concept is that in a race the partners *compete* rather than *cooperate*. Although noble competition is most desirable, it is, in view of



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the existing international situation at least, unrealistic to assume that such important competition will stay in the realm of peaceful manifestations only.

Therefore, a call for international cooperation in the coming series of giant cosmic experiments is the only realistic approach if one really aims at peaceful execution of space exploration. We do not want to fire ballistic missiles across space, but forerunners of manned spaceships. Russia's lead will be short-lived—*sub specie aeternitatis*—and their leaders must realize this. Their opportunity for leading the world in astronautics, in a higher sense than purely mechanically, is gone forever. Our great opportunity is still ahead of us. Will we use it? I herewith renew my call—now post-*Sputnik*—for an International Astrophysical Decade.

Krafft A. Ehricke

Convair-Astronautics
San Diego, Calif.

Jupiter Cover

To the Editor:

I have just received my December copy of m/r and I think that the cover showing the *Jupiter* taking off is one of the outstanding photos you have yet published. Do you think it would be possible for me to obtain a copy of this cover for I should very much like to have one for mounting. I have been taking m/r for 12 months now, and I am certain that it is the best publication of its kind available. Keep up the good work.

L. Sykes

Melrose
Staynall Lane
Hambleton, Nr. Blackpool Lanc.
England

In the mail.—Ed.

Definition

To the Editor:

In regard to your article "Roundup of Surface Equipment Contractors" in the January issue of m/r, you give mention to GFE in transport vehicles and fuel equipment. I have been unsuccessful in finding the identification of the letters GFE and would appreciate your definition of them.

Leon S. Trenholm

RFD No. 1
Bangor, Missouri

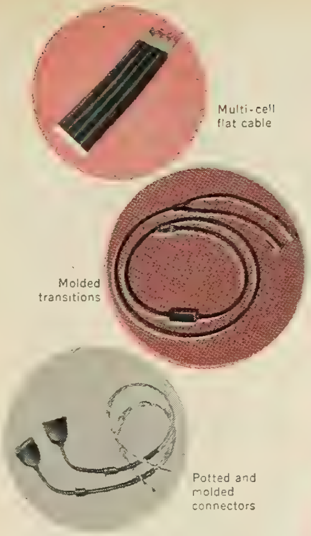
Government Furnished Equipment.—Ed.

Bids Too Soon

To the Editor:

From Dec. 16, 1957 through Jan. 7, 1958, I worked on one of the new *Bomarc* launching installations, part of a $46,000,000 project recently announced by the Air Force. I was present at the opening of the bids on the first installation, to be located at the McGuire Air Force Base near Wrightstown, N.J., in Philadelphia on Jan. 7, 1958.

When I got back to Houston, the January issue of m/r was lying on my desk. It was devoted to "Ground Support Equipment," including, on page 78 and 108, concise, authentic information on the very problem I had been working on—*Bomarc* missile. Had I had this information one month sooner, it would



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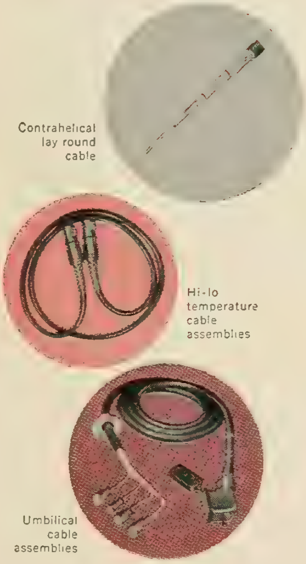
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have been extremely helpful.

As part of my avocation and activities in rocketry, I make numerous illustrated speeches and lectures to engineering, civic and social groups. At these meetings, I am invariably asked, "How can we find out about this business of rockets, missiles and *Sputniks*?"—and I tell them two things: subscribe to MISSILES AND ROCKETS, and join the American Rocket Society.

Lawrence F. Megow
3342 Arbor Ave.
Houston, Texas

Hamilton Standard Engaged in Electronics

To the Editor:

In view of the overall excellence of your magazine, it was quite surprising to find that your listing of companies engaged in electronic and missile activity failed to mention us (page 76, Feb. issue).

Hamilton Standard division of United Aircraft Corp. has been engaged in the design, development, testing and production of electronic controls since 1944. Today, the Electronics Department is established as a virtually autonomous unit at Broad Brook, Conn., to concentrate on the design and development of total weapons systems and airborne electronic systems for both aircraft and missiles. Except for missing us, I think that you have a most excellent magazine, and in this I echo the sentiments of all our technical staff. Keep up the good work.

Roy E. Wendell
Public Relations
Electronics Department
Hamilton Standard Div.
United Aircraft Corp.
Broad Brook, Conn.

Sorry. Hope this takes care of the omission.—Ed.

Standardizing Terms Needed

To the Editor:

First of all, I would like to express appreciation of the fine coverage of the field from A to Z. I am a charter subscriber and have a complete file of m/r, to which I frequently refer.

In a recent issue of m/r, Mr. Arthur F. Joy of Raytheon Manufacturing Co. inquired as to the difference between a ballistic missile and manned and unmanned rockets and missiles, spaceships, and guided and unguided missiles and rockets.

I would like to recommend to Mr. Joy and others interested in these terms, the U.S. Air Force Dictionary published in 1956 by the Air University Press, Woodford Agee Heflin, editor. I am employed as an engineering publications editor, Service Publications, Convair (Fort Worth), home of the B-58 *Hustler*. This dictionary is used as first authority for the words it defines.

A dictionary of aeronautical and astronautical words and terms that is frequently brought up to date will find a very useful place in the industry.

C. Roger Cripliver
4928 Rector Ave.
Fort Worth 15, Tex.

Fine idea. Perhaps this should be undertaken by the IAS or ARS.—Ed.

What's new in TITANIUM alloys:

Advances in aviation technology have happened so swiftly that engineering materials can no longer be selected for their broad use, but rather for the specific tasks they perform.

Today, in the face of tight budgets, the *right* material is the only sound solution to any given problem. Patch-work design, engendered by second-best materials, can only result in second-best aircraft and missiles in uniquely critical times.

To meet the constant tightening of design requirements, Titanium Metals Corporation of America has opened wide new areas of alloy development. This means: heat-treatable bar stock with *guaranteed* capabilities; higher temperature ceilings; broad new strength ranges.

Q. Are the guaranteed heat-treat alloys new?

A. The alloys are not. They have a production history of four years and a wealth of technical data to support them. Recent development of their full heat-treat capabilities has produced such dramatic results that they are considered new.

Q. What are the heat-treat alloys?

A. Ti-155A (5.5% aluminum; 1.5% iron; 1.5% chromium; 1.1% molybdenum) the highest strength bar and forging stock commercially available; and Ti-6A1-4V (6% aluminum; 4% vanadium), which in the annealed condition has already won wide designer confidence. Samples of *guaranteed* minimum heat-treat capabilities show:

	Ti-155A	Ti-6Al-4V
Section size: Up to 1"		
Ultimate Tensile Strength (psi)	170,000	160,000
0.2% Yield Strength (psi)	155,000	150,000
Elongation, % in 4D (Long)	10	10
(Trans)	8	8
Reduction in Area, % (Long)	20	25
(Trans)	15	20

Detailed information on Ti-155A is presented in a 20-page TMCA Engineering Bulletin. Additional data on Ti-6A1-4V, such as fatigue characteristics and guaranteed heat-treat capability are also available.

Q. Are there other new alloys?

A. The leading alloys nearing commercial volume are Ti-8A1-1Mo-1V, a bar stock offering excellent elevated-temperature creep strength to 1000°F, and Ti-4A1-3Mo-1V. The latter, now being produced and evaluated by the Department of Defense sheet rolling program, is designed to fill the need for high strength sheet alloy which can be formed in solution-treated condition and aged to strengths of 175,000 psi. When compared to other high-strength titanium alloys, Ti-4Al-3Mo-1V combines improved formability with outstanding elevated-temperature strength and stability.

Typical Properties — Ti-4Al-3Mo-1V

Condition	Temp. °F	0.2% YS psi	TS psi	Elong. % in 2"
Solution treated	Room	94,000	135,000	14
Solution treated and aged	Room	163,000	175,000	5
	200	142,000	169,000	8
	400	126,000	152,000	8
	600	111,000	140,000	7
	800	98,000	127,000	9

Q. How will these alloys raise temperature limits?

A. Ti-8Al-1Mo-1V is a good example. Although its short-time elevated temperature tensile properties are similar to Ti-6A1-4V, this new alloy offers as much as a tenfold increase in creep strength between 600°F and 1000°F, as shown:

Creep Comparison Between Ti-8Al-1Mo-1V and Ti-6Al-4V

Alloy	Annealing Treatment	Temp (°F)	Stress (psi)	Time (Hrs.)	Def. (%)
Ti-8Al-1Mo-1V	1400°F (24 hrs) AC	850	50,000	300	0.42
Ti-6Al-4V	1300°F (2 hrs) AC	850	50,000	300	3.6
Ti-8Al-1Mo-1V	1400°F (24 hrs) AC	950	15,000	300	0.16
Ti-6Al-4V	1300°F (2 hrs) AC	950	15,000	300	4.3

Now being evaluated by engine manufacturers, Ti-8A1-1Mo-1V appears to answer the need for light-weight strength at steadily higher temperatures. Data on both Ti-4A1-3Mo-1V and Ti-8A1-1Mo-1V alloy are available from TMCA.

All these excellent new alloys have boosted still higher titanium's major advantages of light weight, great strength, superior temperature characteristics, and outstanding corrosion resistance.

To guarantee ready availability of this important engineering metal, TMCA has opened in Toronto, Ohio, the world's first plant designed and instrumented solely for rolling and forging titanium to aircraft quality standards.

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☐ Bulletin 3 Analytical Chemistry of Titanium
☐ Bulletin 4 Mechanical Testing of Titanium
☐ Bulletin 5 Properties of Ti-155A
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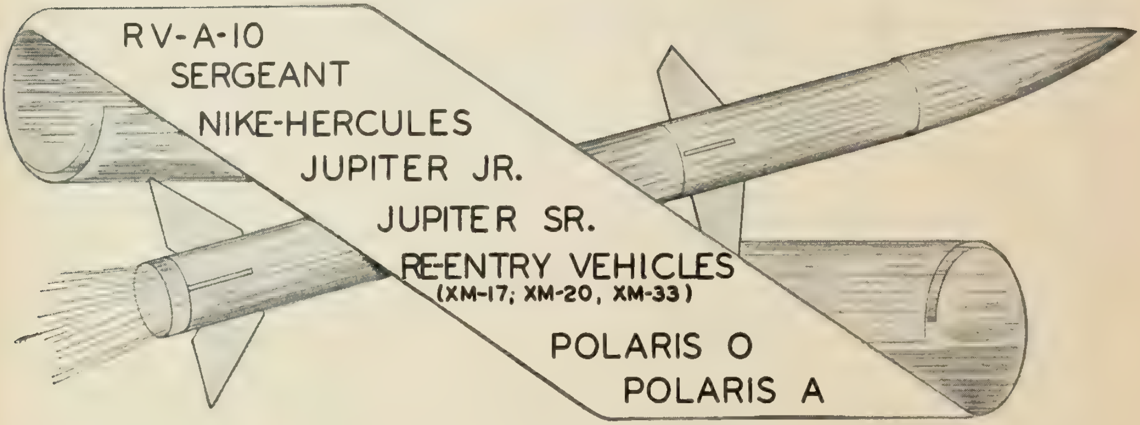
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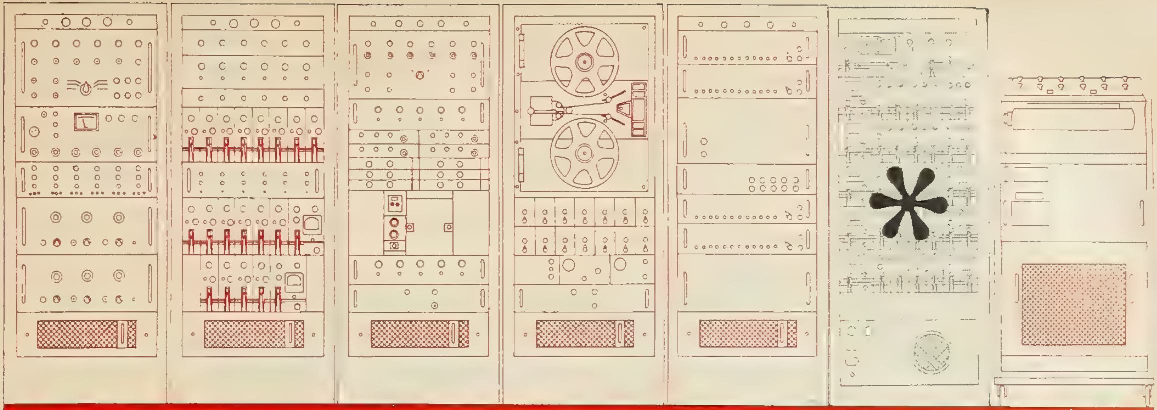

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ELIMINATE SYSTEM ERRORS... AFFORD ECONOMY AND SPACE SAVING ADVANTAGES—

This Hallamore developed building-block type FM instrumentation system is designed to condition and calibrate signals from any combination, or multiples, of the following transducers: potentiometers, flow pickup, bridge, thermocouple, or differential transformers. Hallamore manufactured elements in the system include DC amplifiers, SCO, summers, universal calibrator, calibrator test instrument, timing system and the discriminator station. Hallamore phase-lock discriminators, Model 0162, reduce subcarrier frequency information to output data, relatively undisturbed by noisy signals which contribute to the inefficiency of pulse counting type discriminators.

Designed around a concept entirely new to the telemetry field, the Model 0162 phase-lock discriminator eliminates signal suppression by noise, non-linearity by filtering, and thresholding at low signal-to-noise levels. In addition, the unit occupies less space, reduces overall system cost, and assists in the simplification of operational procedures. For complete specifications and operational data, write Hallamore Electronics Co., Dept. 87, 8352 Brookhurst Avenue, Anaheim, Calif.

HALLAMORE ELECTRONICS COMPANY *a division of the SIEGLER CORPORATION*

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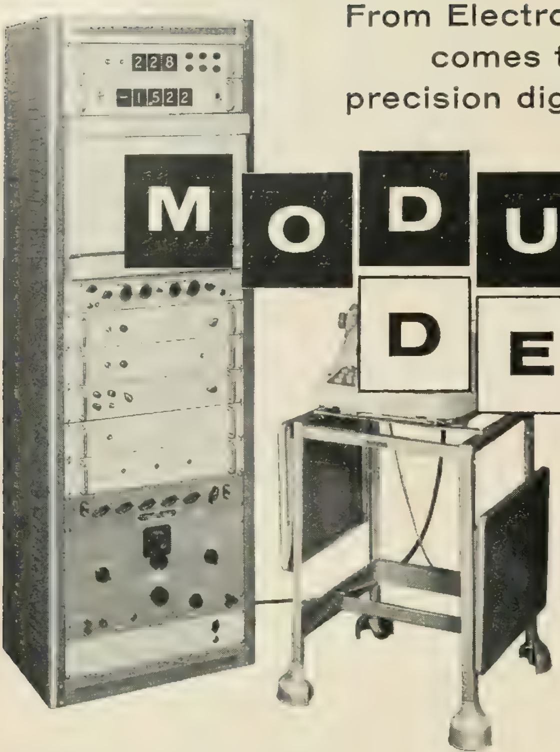

Transistorized, plug-in modules for measuring DC to 0.01%, AC to 0.1%, ohms to 0.01%, DC ratios to 0.01%, and AC ratios to 0.02%

Plus auxiliary modules for building complete automatic digital systems

Typical digital, missile electrical checkout system using the new E-I modular design. All E-I modules are designed to fit standard 19" racks.

Now build precision digital voltmeters, digital ohmmeters, digital ratiometers, or complete digital, missile electrical checkout systems from standard, off-the-shelf modules.

DC DIGITAL VOLTMETERS

Specifications	Model DVA-400	Model DVA-500
Display	4 digits, polarity, decimal point	5 digits, polarity, decimal point
Range	.0001-999.9 volts	0.0001-999.99 volts
Accuracy	±1 digit	±(0.01% and 1 digit)
Automatic Features	Polarity, ranging	Polarity, ranging
Controls	Digits gain, manual and automatic ranging, power on-off-standby	Digits gain, manual and automatic ranging, power on-off-standby

Write for Bulletins 180.1 and 180.2

AC-DC DIGITAL VOLTMETERS

Specifications	Model DVA-410	Model DVA-510
DC	Same as DVA-400	Same as DVA-500
AC		
Accuracy	0.1% or 2 digits	0.1% or 2 digits
Frequency Response	30-10,000 cycles	30-10,000 cycles
Range	.0001-999.9 volts	0.0001-999.99 volts
Controls	Same as DVA-400, AC-DC	Same as DVA-500, AC-DC

Write for Bulletins 180.1, 180.2, 180.4

Modules never become obsolete—As needs change simply regroup present modules or add new ones. Your system is always up-to-date at minimum cost and engineering. Internal construction is also modularized for maintenance ease.

Fully transistorized circuitry—All transistor circuits on encapsulated plug-in cards

- gives increased reliability
- reduces power consumption
- lowers heat dissipation
- permits miniaturized packages
- eliminates radio noise and line transients

Many new advanced application features and specifications—The result of thousands of applications and field experience from more than 2,500 digital instruments and systems.

- Now you can "read through" superimposed ripple on DC—and know its magnitude—by using the calibrated digits gain control located on the front panel. Steps by 1, 2, 3, 4, 5, 10, 50 and 100 digits.
- Controlled ranging by switch position—"automatic," "hold," "manual"—enables operator to manually control range position but still select automatic ranging in the same instrument.
- Power control for "on," "off," and "stand by" positions.
- Wider dynamic range covering all voltages from 100 microvolts to 1,000 volts, resistance range from 10 milliohms to 10 megohms—in single instruments.
- Input power frequencies from 50 to 400 cycles.
- New balance logic for faster down ranging.
- Automatic AC ranging from 30 to 10,000 cycles.
- Controlled stepping switch drive increases switch life by a factor of five—proved by actual tests.
- Meets many MIL specifications.

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1. Universal 3½" x 19" x 12" chassis with mounting hardware for any rack.
2. Digital outputs may also drive storage matrices, go-no go comparators, and other auxiliary modules.
3. All contacts readily accessible at rear panel on connectors.
4. With auxiliary plug-in modules, digitized data is provided in printed form, punched cards or tape with no modification to basic measuring instruments.

DIGITAL OHMMETERS

Specifications	Model DOA-400	Model DOA-500
Display	4 digits	5 digits
Range	00.01 ohms to 10 megohms	000.01 ohms to 10 megohms
Automatic Features	Ranging	Ranging
Controls	Digits gain, manual and automatic ranging, power on-off-standby	Digits gain, manual and automatic ranging, power on-off-standby

For accuracy specifications see Bulletin 180.3

Write for Bulletins 180.1, 180.3

AC RATIOMETERS

Specifications	Model DRA-480	Model DRA-490
Display	5 digits	5 digits
Ratio Range	0.0000-1.0999	0.0000-1.0999
Accuracy*	±2 digits	±2 digits
Controls	Digits gain, power on-off-standby	Digits gain, power on-off-standby, reference selector
External Reference	1 volt rms	Choice of 3

*Calibration at 400 cycles; 60 cycle models also available.

Write for Bulletin 180.9

DC RATIOMETERS

Specifications	Model DRC-400	Model DRC-500	Model DVC-400†
Display	4 digits	5 digits	4 digits, polarity
Ratio Range*	.0000-.9999	.00000-.99999	00.01-99.99 volts
Accuracy	±1 digit	±(0.01% and 1 digit)	±1 digit
Controls	Digits gain, power on-off-standby	Digits gain, power on-off-standby	Digits gain, power on-off-standby
External Reference**	1 to 10 volts	10 to 100 volts	±100 volts

*Models DRA-400L and DRA-500L, 10% overscale read out. For higher ratio ranges, see Bulletin 180.7.

†Recommended for computer applications.

**Internal reference supply optional; specify DRA in place of DRC.

Write for Bulletins 180.1 and 180.7

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INC.
3794 Rosecrans Avenue
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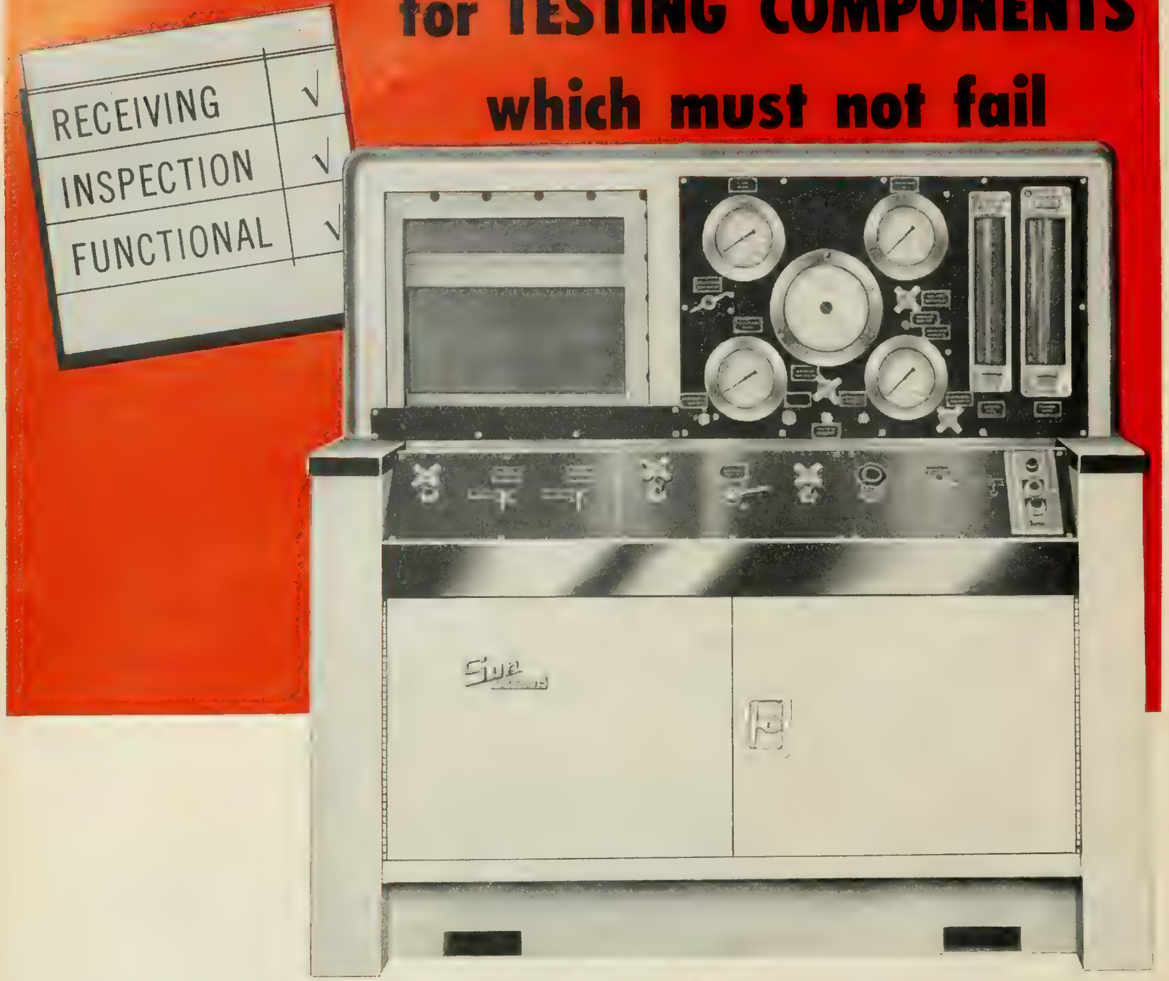

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The stand provides means for both dynamic and static hydraulic system testing as well as a pneumatic system with all instrumentation and controls to measure pressure and flow at the inlet and outlet ports of the device under test.

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Sun engineers can help you with your testing problems whether they be hydraulic, pneumatic, electronic, or any combination of the three. A call to your nearest Sun Aeronautical Division will bring an immediate response.

GENERAL SPECIFICATIONS

Model No.	LS-224
Nomenclature	High Pressure Pneumatic and Hydraulic Test Stand
Purpose	Hydraulic Components Tester
Dynamic Hydraulic System	Remote supply, delivers 5 gpm at 3000 psi
Static Hydraulic System	Remote supply, delivers 1 gpm at 100 psi boosted to 20,000 psi by air-operated boost pump
Pneumatic System	100 psi
Controls and Instrumentation	Circuit controls, pressure gages and flowmeters. Illuminated instrument and Control panel recessed and angled for easy viewing and operation

Sun ELECTRIC CORPORATION

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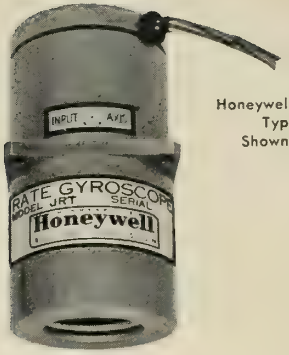

Honeywell Rate Gyro
Type JRT
Shown ½ size

First test firing of the ATLAS ICBM at Cape Canaveral, Florida, June 11, 1957.

Flight Control for the ultimate weapon

Three Honeywell Rate Gyros, Type JRT, provide missiles with precise three-axis directional stability and are currently being supplied to the ATLAS missile program.

The Type JRT is a highly accurate precision instrument for measurement of absolute rates of rotation in inertial space. Viscous damping is electro-mechanically controlled to maintain a constant damping ratio over the entire operating temperature range of −65°F. to +175°F.

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- **FULL SCALE RATE:** Up to 1000 degree/second.
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- **RUGGED:** Withstands 100 G shock.
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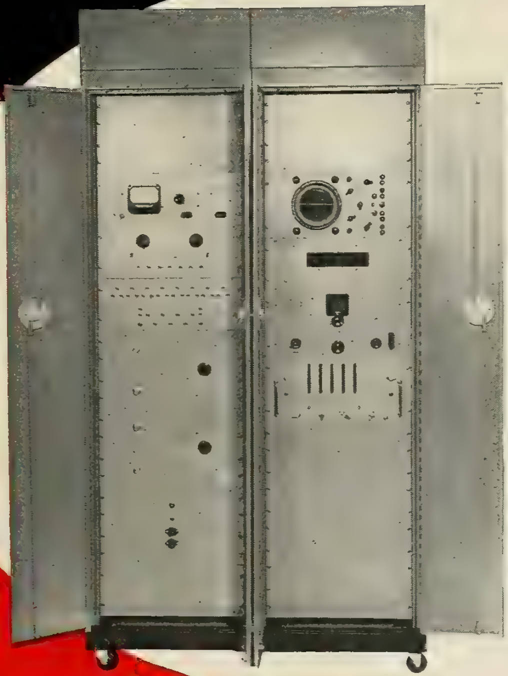

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	BAND PASS AND LOW PASS FILTERS		**PDM-TO-DIGITAL CONVERTER** for use with digital data systems.		**TRANSMITTING COMPONENTS AND SYSTEMS**

*[illegible]

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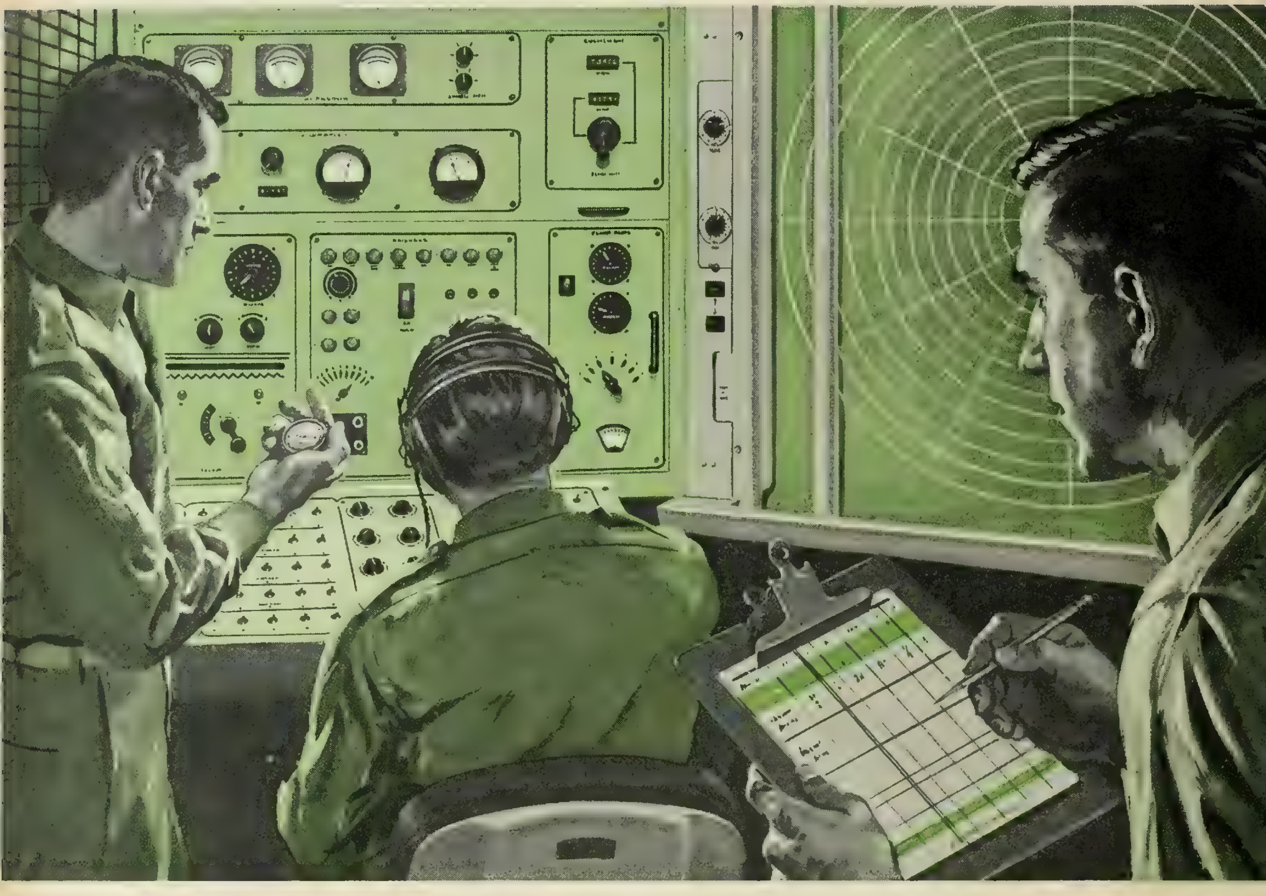
If your problem calls for

MISSILE TRAINING



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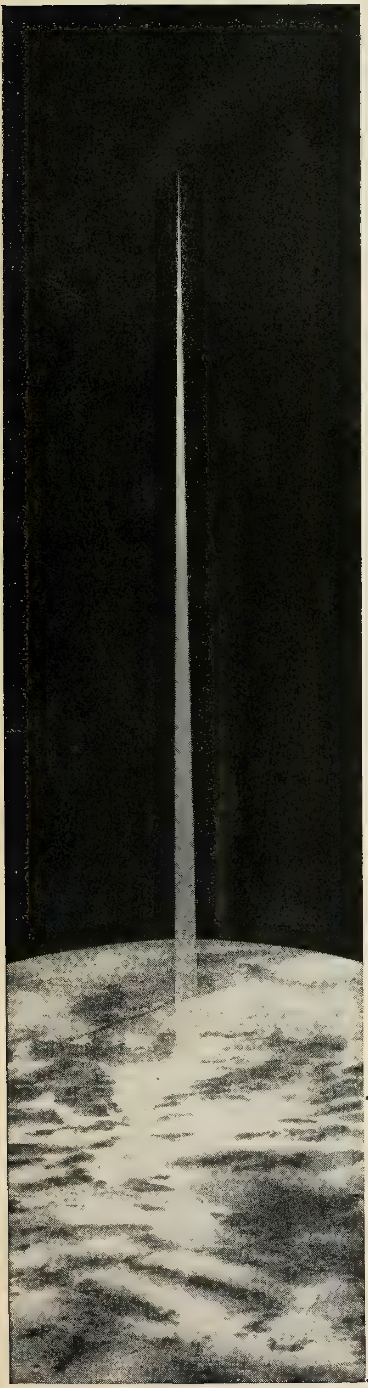

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NORMAN C. REUEL received his BS in Chem. E. at Georgia Tech. and an MSAE at Cal. Tech. specializing in jet propulsion. Following rocket and radar development in the Navy he joined North American Aviation in 1946 as a research engineer. Now assistant chief of design and development, he also finds time to relax at his ranch home, bowl, golf, and play tournament bridge.

PAUL D. CASTENHOLZ, Pacific combat veteran, graduated B.Sc. (Eng.), UCLA 1949. From research engineer his grasp of rocket engine work raised him through a supervisory post in experimental development to assistant group leader in combustion devices, and then to group leader of experimental engines. Recently completed requirements for his MSc. Relaxes with hi-fi, fishing and back packing.

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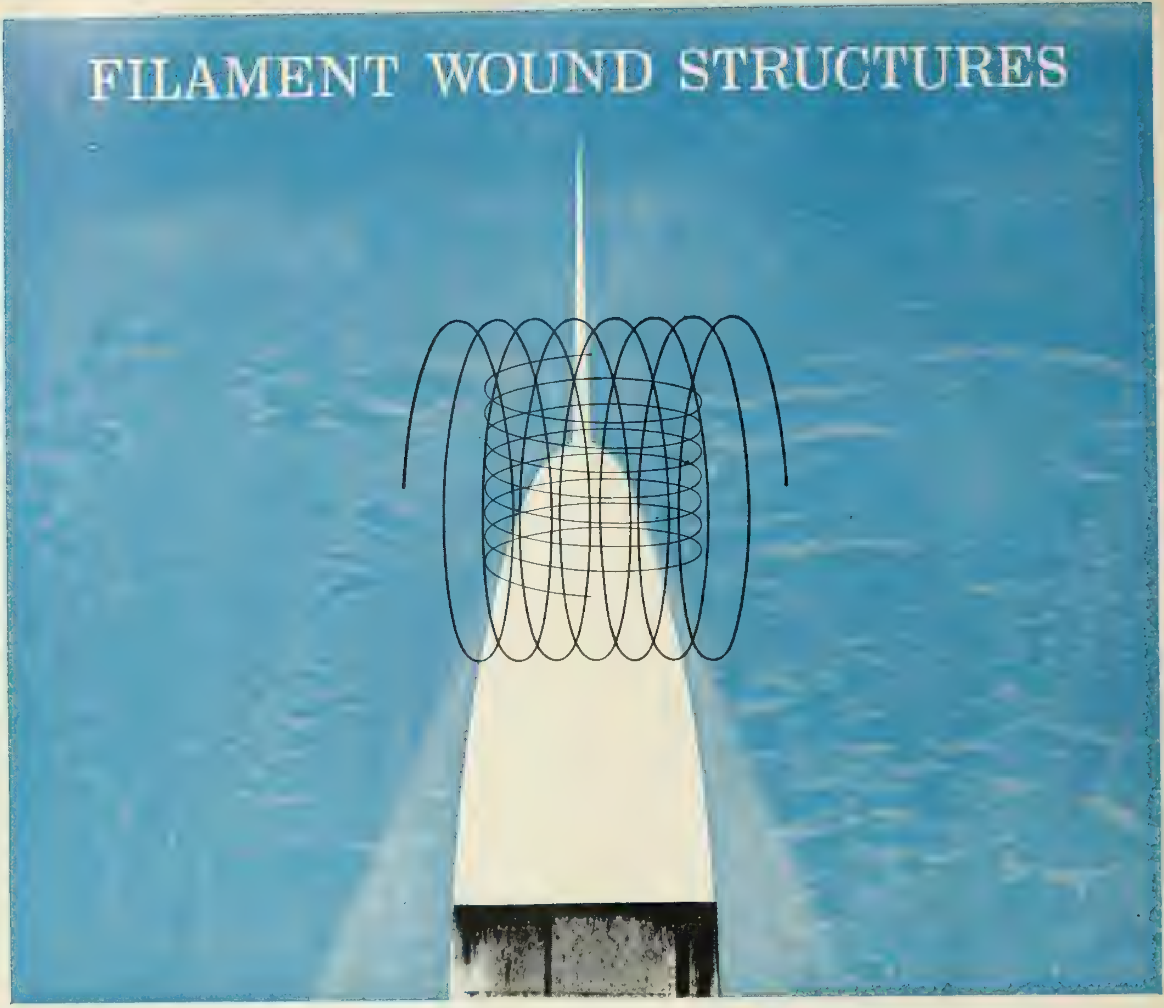

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NEWS AND TRENDS

U.S. To Launch Nine Satellites By 1959

Army gets approval for five more *Explorers*; *Vanguard* 'grapefruit' still bogged down

by Erik Bergaust

The Army has been authorized to send aloft another five Explorers, but this venture is not scheduled as part of any national space flight program. At the end of February no steps had been taken in Washington to finalize a space flight agency. Missiles & Rockets **questioned a number of the nation's top missile experts as to whether they had been invited or approached by the Defense Department for participation in a national space flight program. The answer was negative in every instance.**

Frustrated Washington missile officials have expressed the hope that the United States will launch successfully nine satellites by 1959. Explorer II is scheduled to be fired this month. The Vanguard grapefruit carrier, after having been bogged down in technical complexities, was set for another try as m/r went to press. The International Geophysical Year already is nine months old.

In secret testimony before the House Appropriations Committee last month U.S. satellite officials learned that the United States has gained much information from the two *Sputniks*. In fact, the U.S. IGY Committee appeared to have used this argument as a stepping stone to get more money "to expand their studies." Hugh Odishaw, executive secretary of the U.S. IGY program indicated the American scientists gained information from the *Sputniks* without any aid from the Reds. The request for an additional $2,100,000 in "emergency funds" was made.

On the other hand the U.S. IGY committee last month stated that none of the information offered by the Russians on the first two *Sputniks* was new. The first official Red report does not contain any of the measurements made by instruments in the satellites. It lists only the type of measurements made, the equipment carried and orbit data from the ground tracking stations.

Data from *Sputnik* I will not be available before June and data from *Sputnik* II not before July.

The report was sent by the USSR on January 27 and received at the IGY headquarters in Brussels on February 11.

Orbit velocities and altitudes corresponded with those reported by tracking stations in the United States.

The five satellites scheduled for launching by the Army this year will be put into orbit by the *Jupiter*-C vehicle.

Explorer II will incorporate a tape recorder, allowing storage of information until it passes over a ground receiving station, at which point the stored data will be transmitted to earth.

As m/r went to press, there were reports in Washington that a 500-pound satellite would soon be launched by the Army, using a *Jupiter* IRBM as the first stage.

Red Moon Rocket on Launching Pad?

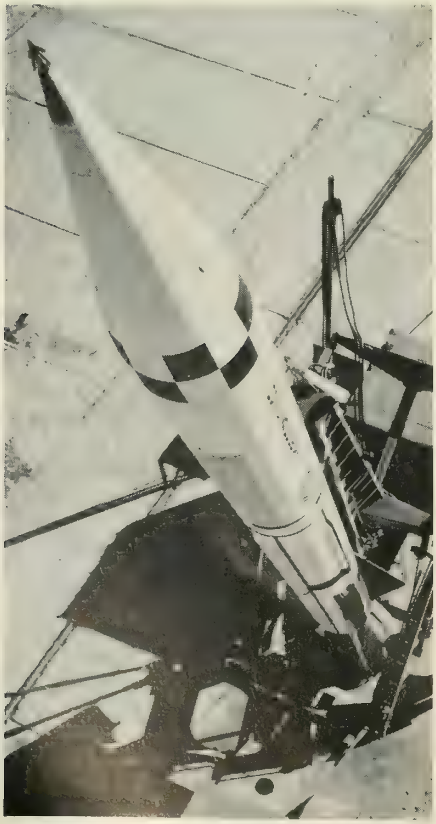
European scientists who visited the USSR recently confirmed to m/r that the Reds are pushing hard to launch their first moon rocket. After a relatively "quiet" period with no Sputnik *launchings and very few IGY sounding-rocket firings, the Reds apparently are concentrating their efforts on Project* Boomerang.

As reported in last month's issue of m/r, the Reds' effort to place an instrumented vehicle in an elliptical orbit around the moon (Project Boomerang*), has been placed under the direction of Prof. G. A. Chebotarev. One year ago Chebotarev authored a paper on the method of placing a payload of 110 to 220 pounds in a lunar orbit.*

From reliable sources overseas, m/r has learned that the Russians have conducted several unsuccessful satellite launchings and that they already have tried—unsuccessfully—to reach the moon. Nevertheless, the general feeling is that they will get a moon rocket under way before the United States. However, some Russian scientists have expressed their concern over the difficulties involved in launching a rocket around the moon. Prof. V. Sharonov, writing in Izvestia, *says that "the task of orbiting an artificial satellite around the moon is very far from the practical capabilities now available to us." One should remember, however, that Russian scientists less than a year ago also warned about the difficulties of launching satellites such as* Sputnik *II.*

eb

U.S. MISSILES in the NEWS

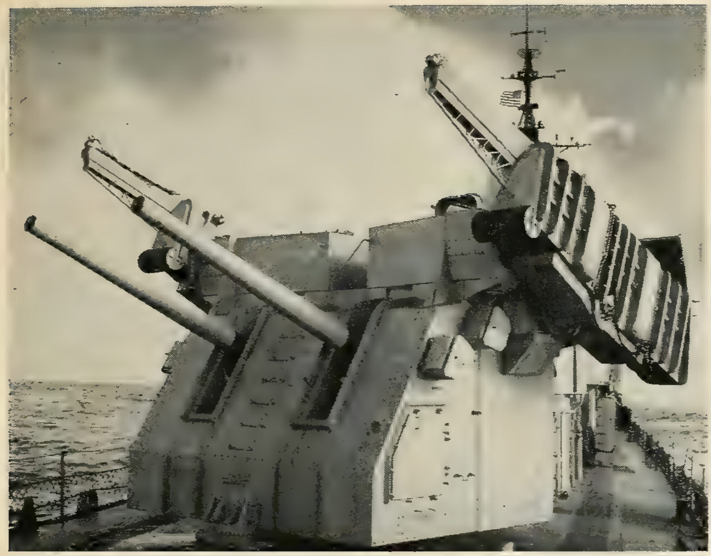


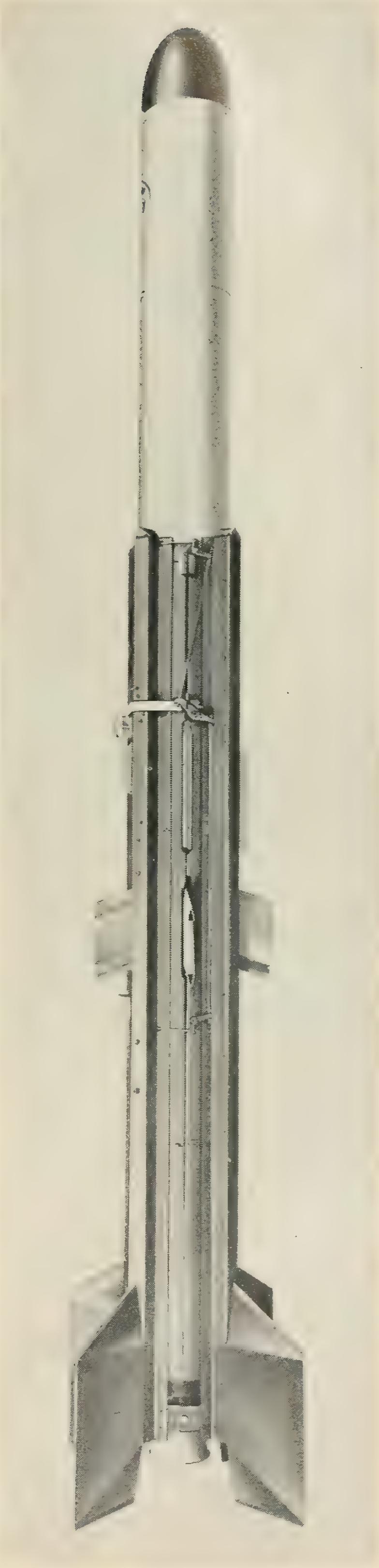
THIS NATION'S largest solid-propellant missile, the *Sergeant*, is now in production for the U.S. Army, with first deliveries to troops expected in the near future.

A second generation missile, the *Sergeant* will succeed the four-year-old *Corporal* missile, with incorporated improvements over the *Corporal*'s thrust and accuracy. The anticipated range of the thirty-foot-long missile will be close to 200 miles compared with the *Corporal*'s 75-100 mile range. An operational battalion for the *Sergeant* is expected to be under 200 men.

All system elements for the missile have been designed for portability and mobility incorporating government-furnished equipment for transportation vehicles. Guidance is achieved by an inertial system requiring only a programmed pitch control for range variation. This makes the weapon extremely ideal for battlefield operation. In contrast, the *Corporal* is controlled by radio signal during its powered flight making it susceptible to enemy countermeasures.

The *Sergeant* is the latest member of a family of Army missile designed and developed by the Jet Propulsion Lab. These include *Private* A, *Private* F, *WAC Corporal, Corporal,* and the *Sergeant*. Next in the series will be the *Pershing* 500-mile solid-propellant rocket. The Sperry Gyroscope Co. will be responsible for production of the complete *Sergeant* missile system.





A RAT is the Navy's latest defense against enemy submarine "wolf packs." The new rocket-assisted torpedo, which is launched from destroyers in pursuit of enemy subs, is expected to be in fleet operation by the end of this year.

The weapon system consists of a standard homing torpedo, solid-propellant rocket booster and detachable aerodynamic control surfaces for stability. The missile is 16 feet long and weighs 450 pounds. It was developed by Naval Ordnance Test Station, Pasadena and China Lake, Calif., developers of the *Sidewinder* air-to-air missile.

After the destroyer's sonar searching equipment detects and begins the tracking of the enemy submarine, the ships fire-control system trains and elevates the RAT launcher and sets the range. The rocket motor propels the torpedo along a ballistic flight path and separates along with the airframe after burnout. Two parachutes lower the torpedo to the water where the parachutes and nose cap are discarded. The torpedo then starts a circling search pattern until the homing device makes contact and guides the weapon to the target. The missile may also be air-launched. RAT will not home on the launching ship in the event it misses its target.

Military Rockets Cheaper for Space Exploration?

by Norman L. Baker

In recently published secret testimony, Garrison Norton, assistant Navy secretary for air, was quoted as saying that the use of *Jupiter*-C rockets for launching satellites was "very, very expensive and rather inefficient when compared with the Navy's *Vanguard* launching vehicle."

Army officials questioned on this statement answered that this was the reverse of actuality and that Norton's remarks could be easily repudiated.

Norton said it would be wasteful to divert any military missile hardware for space projects "at this stage of the game.

"These motors and complexes were designed for an entirely different purpose: the sending of large warheads certain distances and the placing of those warheads very accurately on target. This is basically an entirely different problem from trying to put a small-size satellite in orbit. I think if you looked into the economics of the business you would find that using any of our large-scale missile hardware to launch satellites is a costly operation compared to *Vanguard*," he said.

Economies of *Vanguard*

A check into the economies of the *Vanguard* and *Jupiter*-C projects and a comparison of the costs of the two brings to light several interesting facts.

The *Vanguard* program, as originally conceived, required 13 launching vehicles to fulfill its mission during the IGY. The first vehicles were modified *Viking* research rockets left over from an earlier high-altitude research program. The third vehicle was a *Vanguard* configuration with a dummy second and third stage. The remaining nine rockets were destined to launch four four-pound test satellites and six 20-pound full-size satellites.

The first appropriation for the *Vanguard* project totaled $29 million. That figure was soon raised to $110 million, the figure released June 1, 1957. It is believed that this total has been increased in recent months but there has been no official release on *Vanguard* funds since the June 1957 report.

The $110-million appropriation figure would give each *Vanguard* vehicle a price tag of approximately $8.5 million. Assuming a 100 per cent success in the satellite launching attempts, the United States would have 136 lbs. of instrumentated satellites circling the earth at a cost of approximately $800,000 per lb. When the *Vanguard*'s empty third stage rocket is included in the satellite weights (it will weigh about 50 lbs. and orbit with the 'sphere') as is done with the *Explorer*, the cost-per-lb.-of-satellite figure drops to about $160,000. Taking into account the last two failures and assuming complete success on the remaining vehicles this latter figure increases to $200,000 for each pound of maximum satellite weight.

Army officials have disclosed that each of the *Jupiter*-C research rockets have an average cost of $1.5 million for hardware and $2.5 to $3 million for accomplishment of a launching. Twelve *Jupiter*-Cs were fabricated for the Army Ballistic Missile Agency's re-entry test program for the *Jupiter* IRBM. Three of these research rockets were tested successfully—out of three launchings. The last one fired propelled a dummy fourth stage rocket and 5-lb. satellite 3300 miles over the Atlantic in September 1956. Officials point out that this shot could easily have launched the world's first satellite.

The three tests convinced the Army that the nose cone re-entry headache was a problem of the past there by making available nine research rockets with satellite capabilities.

Therefore, if the value of the re-entry tests are ignored, the *Explorer* I cost $390,000 for each pound. If the eight remaining *Jupiter*-C rockets each launch satellites of the same weight as *Explorer* I, each pound of satellite will cost $130,000.

Dr. Wernher von Braun announced that a 50 per cent increase could be made in satellite weight and still place the payload in an orbit with the same vehicle. Cost: $65,000 per pound of satellite.

Army officials have stated that a 300-lb. satellite could be launched with the *Jupiter*-C after further modifications. Depending upon how many of these were launched the lb.-satellite figure would range from $12,000 to $65,000.

The total research and development costs for the workhorse of the *Jupiter*-C, the *Redstone* rocket, would obviously raise the costs of the *Jupiter*-C rockets slightly but the costs of developing the individual systems of the *Vanguard* (*Viking*, *Aerobee*, *Hermes* first-stage engine, etc.) must also be considered as above and beyond the *Vanguard* funds.

Based upon the preceding cost figures and anticipated successes versus actual successes *Vanguard* costs would be double to three times those of *Jupiter*-C.

With each launching failure the satellite costs jump sharply and the *Vanguard* still must prove its system capability while *Jupiter*-C continues to pay off.

NAA Hydyne Fuel Boosted *Explorer* I

A Rocketdyne liquid-propellant rocket engine, burning a new high-energy fuel compound and liquid oxygen, provided the first-stage power to lift the Army's *Explorer* I satellite into outer space.

Test-flown more than a year ago, the powerful rocket booster was modified from an engine series in production by North American's aviation division for the Army's *Redstone* medium-range ballistic missile.

The satellite launching fuel was a hydrazine-based compound developed by Rocketdyne engineers. Nicknamed Hydyne, the fuel increased thrust and missile range by 12 per cent over that of a conventional *Redstone* engine.

Dr. Jacob Silverman, supervisor of Rocketdyne's propulsion research thermodynamics unit and a leader in the development of Hydyne, first started work on the new compound early in 1956. The problem faced by Silverman and the company's chemical engineers was that of developing a fuel that would increase performance and could be substituted for the alcohol usually burned in the *Redstone* engine.

Their studies led to two commercially available chemicals that never before had been used at the high-trust levels of rocket engines. By a unique blending of the two, the engineers developed a compound that retained the physical properties of alcohol, required no change in engine hardware or missile tankage, and increased the total burning time and burnout velocity.

The *Redstone* engine series—rated in the 75,000-pound-thrust class—has been in production by Rocketdyne since 1952.

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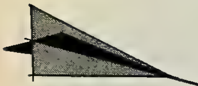

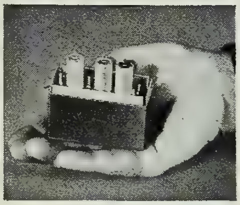

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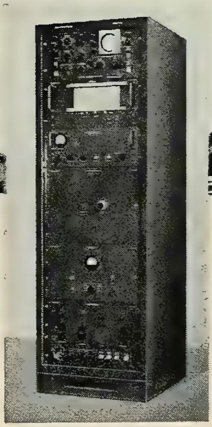

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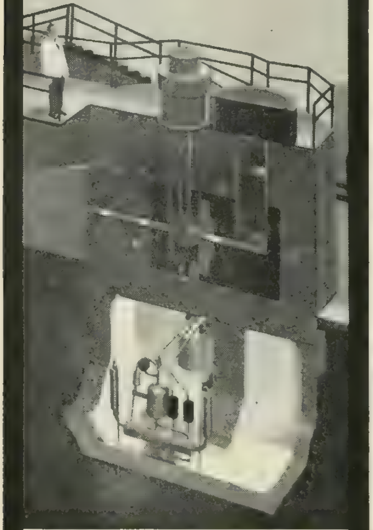

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Snark Disclosures Fit with Carrier-base Plan

by Raymond M. Nolan

WASHINGTON, D.C.—Details disclosed by Northrop Aircraft about the *Snark* missile added new credence to the suggestion that *Snark*s be used as an interim intercontinental striking force launched from aircraft carriers (editorial, February m/r).

Northrop Vice President John Alison stated that the *Snark* needed only a minimal launch area because of its zero-launch feature. This raises the speculation that the missiles could be fired from carriers while positioned in the existing launchers now used for ground-based firings. Since the *Snark* uses conventional jet fuel and solid-propellant rocket boosters, the standard Navy objection about liquid rocket fuels would not be raised.

Sources in Washington recently confirmed that the Navy is presently conducting feasibility studies on the carrier-launched *Snark* and that, because of the relatively low cost and short time involved to make this system operational, prospects look good.

A significant statement by Alison was that the *Snark* is not now used to its full operational capabilities but could, in fact, impact on Moscow from anywhere on the eastern seaboard. He gave the range as more than 5500 nautical (6300 statute) miles. Ward Dennis of Northrop's development planning section added that the *Snark* had inherent qualities equal to any manned aircraft and that dogleg courses to avoid populated areas or for maximum evasive action could be programmed into the *Snark* before launch. Dennis also said that a recall signal or the capability for a recall or destruct signal could be programmed into the *Snark* by the launching commander. However, he added, the destruct or recall capability could be sealed off in the case of anticipated enemy interception or jamming on the recall or destruct channels.

When asked about costs of the *Snark*, Dennis stated that the *Snark* is about one-tenth the size of a B-52 and that costs are in the same area—roughly one-tenth that of a B-52. Since present B-52's cost somewhere around $6 million (after production of about 600), a *Snark* probably costs between $800,000 and $1,000,000 now, but could come down in price to $500,000 when a sufficient quantity has been produced.

Mr. Dennis emphasized that, since over $400 million have been pumped into the research and development program, economy of production can never be realized while these units are in pilot production nor can effective retaliatory measures be possible without great numbers of *Snark*s. Present production contracts total $143 million, but the actual number of *Snark*s ordered was not revealed. He proposed that *Snark* be put on a high production schedule for both these reasons.

His contention is that with any

weapon, superiority in numbers is the major factor in the degradation of a defense system and that combinations of high- and low-altitude *Snarks* coupled with IRBMs and manned bombers could achieve penetration far beyond that of one or more IRBMs or ICBMs.

Throughout his talk, Dennis emphasized the terms "large payload" and "thermonuclear payload." This would seem to indicate that the *Snark,* though only one-tenth the size of a B-52, has a warhead capacity near that of a B-52 and certainly well beyond that of an IRBM or ICBM.

AMF Reveals *Talos* Automation System

The first automatic missile loading and launching equipment for firing *Talos* surface-to-air missiles has been completed and is now undergoing extensive testing by the U.S. Army.

Designed and built by American Machine & Foundry under subcontract from RCA, the prototype automatic loading and launching equipment and associated missile handling equipment is installed at White Sands Proving Ground, N.M. Pending the results of current tests and final contract negotiations, pilot production of the launching equipment would take place in a 200,000-square-foot government plant near Rochester, N.Y.

Each *Talos* defense unit includes a missile handling and assembly area and two automatic launchers, each supported by a circular missile-storage magazine resembling a railroad roadhouse. Capable of handling missiles with high-explosive or nuclear warheads, the launchers can fire either single missiles or salvos to engage a number of different targets simultaneously and can continue to fire at a high rate over an extended period of time.

On command from electronic computers in the control station, the launcher turns toward the cell in the circular storage magazine which contains the desired type of missile for the tactical mission. A cart runs out to the automatically preselected cell, picks up a missile and returns to the launcher.

The missile is then positioned in the launcher where it is elevated and rotated to firing position. When the firing signal is received, the missile is fired automatically and the launcher recycles for the next round.

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'55 Decision Blocked Army Satellite Try

In the wake of the failure of the Navy's *Vanguard*, Feb. 4, a check of information available in Washington has made it apparent that a little-known committee action in 1955 may have been a root of the trouble. The difference might have been an American satellite in orbit two years ahead of *Sputnik* I—if Army vehicle proponents were right in their claims—but certainly a year earlier.

The decision—by Deputy Defense Secretary Donald Quarles—was announced July 29, 1955, when the U.S. Government ruled out the Army-backed Project *Orbiter* in favor of *Vanguard*. Action was based on a six-to-three vote of the so-called Stewart Committee, which had been given the job of deciding which vehicle the United States would back in its IGY satellite-launching program.

The committee consisted of Dr. Homer J. Stewart, chairman; Dr. Clifford Furnas, Dr. Robert McMath, Dr. Joseph Kaplan, G. H. Clement, Prof. John B. Rossner, Dr. Charles Lauritsen, RADM Paul A. Smith (USCG Ret.), and Dr. Richard Porter—who is now chairman of the U.S. International Geophysical Year Satellite Committee.

No reason for the committee majority's disapproval of the *Orbiter* proposal has ever been given officially, but the three dissenters, Drs. Stewart, Furnas and McMath, wrote a strong dissent.

A comparison of the 1955 proposals shows that *Orbiter* consisted of a *Redstone* first stage with clusters of *Loki* rockets in the succeeding stages; while *Vanguard* was to have some sort of *Viking* configuration with a *Hermes* engine to power it (in the first stage).

In theory, this was fine. General Electric, at the time, had several *Hermes* engines on the shelf and the idea of the *Vanguard* people was that these could be fitted to vehicles in a hurry—thus first-stage power would be no problem. But, according to one Pentagon source, the *Hermes* engines proved to be, among other things, too rusted for use on the first-stage vehicle. GE had to design a new first-stage engine, although *Orbiter* backers insist that Reaction Motors already had an engine which could have put the *Vanguard* first stage in the air.

Nevertheless, GE tackled the job of coming up with an entirely new engine and it is this unit which currently powers the *Vanguard* in the first part of its journey. Meanwhile, ABMA was shooting *Redstones* almost at will, with few failures.

Only under the impetus of the Russian achievements was the Army proposal reactivated—this time under the name of *Jupiter*-C, the designation of the vehicle which had solved the nose-cone re-entry problem for the Army.

The rest is history—America had a satellite put into orbit by a vehicle

Presidential Science Adviser Dr. James R. Killian, Jr., chats with Diversey Engineering Co. President J. H. Kauffmann, at the conference on "America's Human Resources to Meet the Scientific Challenge" Feb. 3-4 at Yale University. A joint project of the President's Committee on Scientists and Engineers and the William Benton Foundation, the conference's object was to explore methods for improving the U.S. supply of scientists and engineers. Those who participated included leading industrialists, educators, scientists, private study groups, interested government officials and members of the national press.

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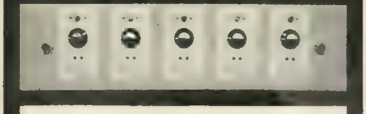

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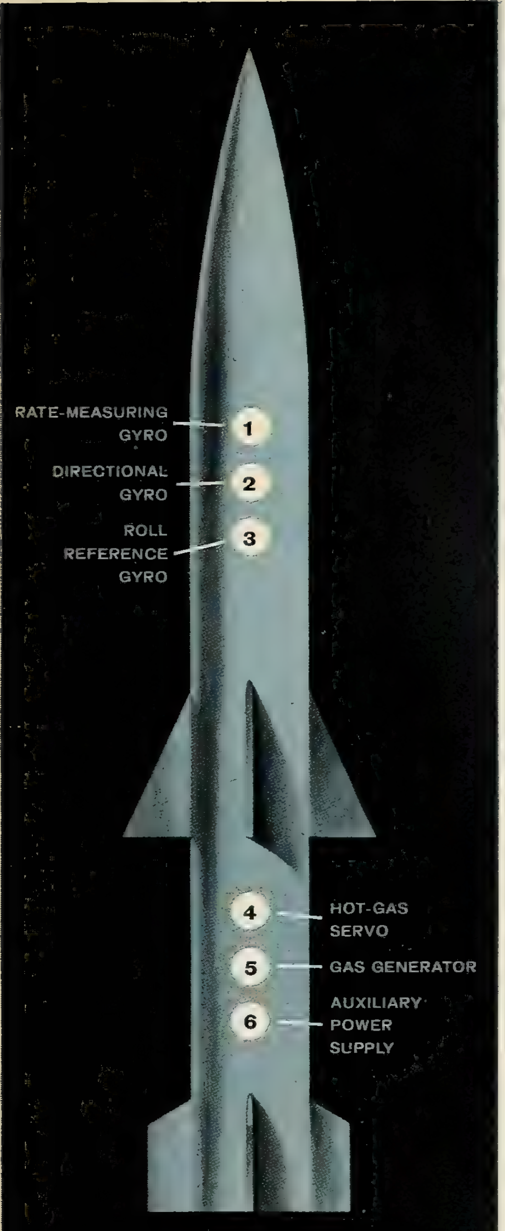

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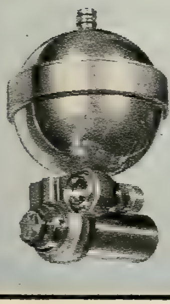

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not much different than the one proposed while Project *Orbiter* was still alive.

As for the *Vanguard*, in spite of official reasons released to the public, the general opinion is that it has not flown mainly because of an inadequate first-stage engine.

Sources close to the situation say that failure of the *Vanguard* that attained a 96-inch altitude before burnup was due to engine-wall failure. Unburned fuel used for regenerative cooling prior to ignition caught on fire when the engine wall gave out under excessive temperatures.

The second failure—the one caused by midair breakage—was blamed on a faulty wire in the control system. It is believed that this wire broke because of excessive vibration. Statements in the general press, such as "the *Vanguard* finally struggled into the sky" are the clue: the marginal thrust-to-weight first-stage engine got the *Vanguard* off the ground but components normally able to withstand missile flight could not put up with the vibrations encountered as the missile groaned skyward.

Lockheed Prepares *Polaris* for Ground Test

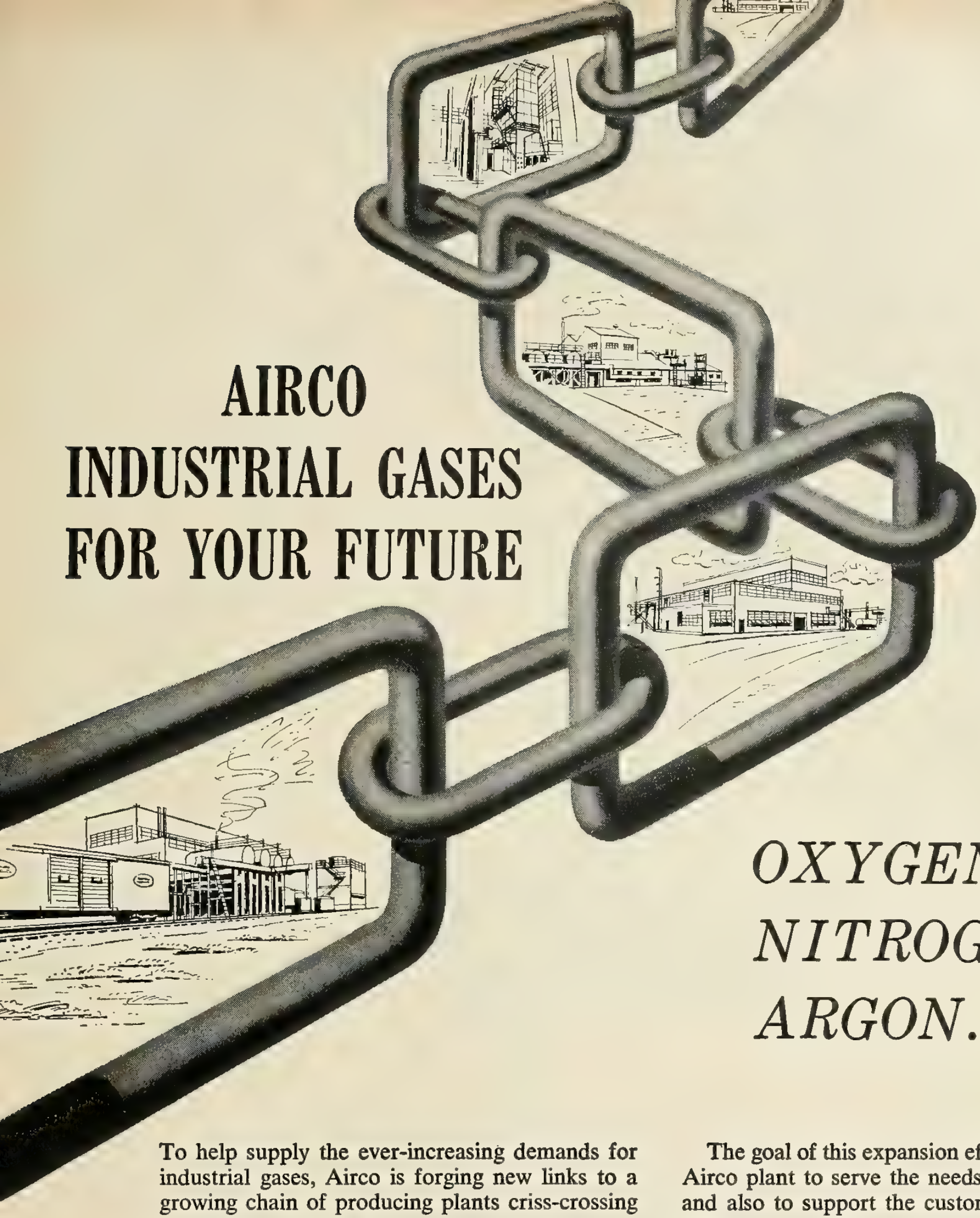
The Navy is accelerating the ground test program for the recently accelerated *Polaris* fleet ballistic missile. First ground test is expected within the next few months. This program is in addition to the *Polaris* test vehicle program which has been underway since last fall.

Construction will begin immediately on a special Navy-owned *Polaris* test facility on 271 acres loaned to the Navy by Lockheed. This multimillion-dollar building project, comprising a complex of huge concrete and steel missile test stands and special related buildings will be located at Lockheed's 4000-acre remote test site in the Santa Cruz mountains south of San Francisco.

L. Eugene Root, general manager of the Lockheed missile organization, said that the recently announced acceleration of the submarine-launched *Polaris'* development places heavy importance on the new ground test station.

"Because we must compress *Polaris* development time, we must speed up our program with as much ground testing as possible of each component or whole missile before we finally expend it in flight test," he said.

Root explained that static or ground testing of parts at the new facility will take place under conditions that



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are closer to actual flight conditions than any other method short of flight. Actual firing of rocket engines, for example, will create flight-like conditions of heat and vibration during the checkout of electronic equipment, guidance systems and other key components.

Goal of the tests will be to increase system reliability, decrease overall test-program costs and speed availability of the operational *Polaris* missile, Root added.

Supporting the Santa Cruz test-stand complex, the Navy *Polaris* test facility will have a control blockhouse with elaborate instrumentation, control and simulation equipment; an assembly building, engineering building and test-stand workshop.

Franklin Institute to Run Astronautics Lecture Series

A series of 10 space travel lectures, "Ten Steps Into Space," will be given at The Franklin Institute, Philadelphia, Pa., on Tuesday evenings at 8 p.m. from March 4 through May 6.

Dr. I. M. Levitt, Director of The Franklin Institute's Astronomy division, announced the lecturers will be the ranking men in the astronautics field in this country. Each authority will speak on his specialty.

Willy Ley, noted historian on space travel, will begin the series on March 4. Dr. Ley's lecture, "The Long History of Space Travel," will provide the foundation for the following talks.

Other lectures are: March 11—Kurt Stehling, "The Rocket and the Reaction Principle;" March 18—S. Fred Singer, "Satellite Instrumentation —Results for the IGY;" March 25—Krafft A. Ehricke, "Space Navigation —The Path to the Planets;" April 8—Ernst Stuhlinger, "Propulsion Systems —Gases, Ions and Photons;" May 6—I. M. Levitt, "Satellites and Travel in the Future."

The series fee will be $10; individual lecture fee, $1.50. Persons may register by mailing the fee to: Astronautics, The Franklin Institute, Phila. 3, Pa.

Univ. of Mich. Offers Automatic Control Course

The University of Michigan College of Engineering has announced a summer Intensive Course in Automatic Control scheduled for June 16-25, 1958, inclusive. The course is intended for engineers who wish to obtain a basic understanding of the field, but who cannot spare more than a few days for this purpose. Its aim is to make the subject matter easy to learn

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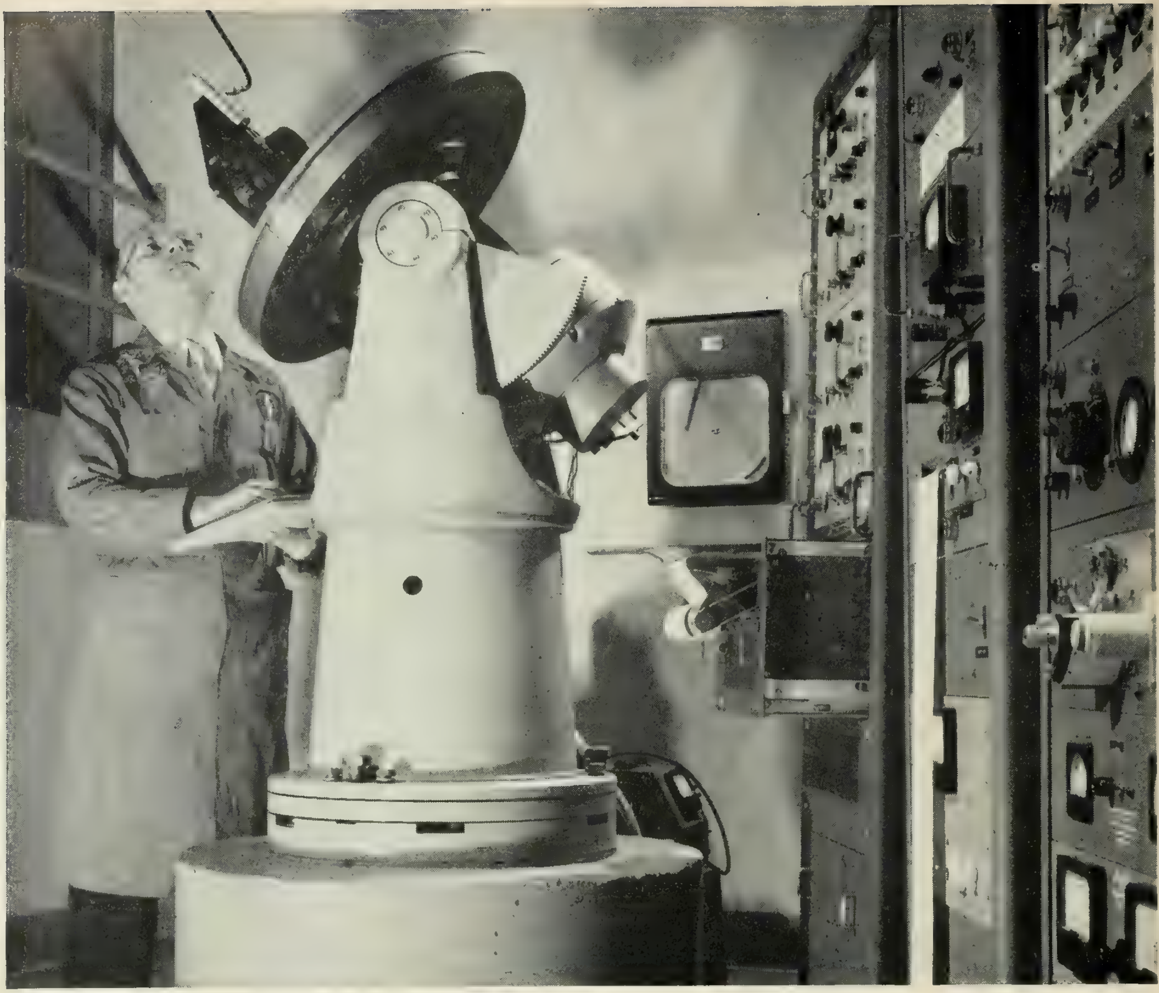


Ford Instrument Co. Engineer checks air-bearing gyro for angular drift on equatorial test stand. Test can show up drift rates as low as one revolution in 40 years. Tests like this . . .

helped Army put "Explorer" into orbit

Some of Ford Instrument's current or recent programs include:

Inertial guidance systems . . . including Redstone and Jupiter
Missile launching and control order computers
Navigational and mission control systems and computers
Analog and digital computer systems
Fuzing, arming and other warhead control equipment
Plotting equipment
Nuclear systems and controls
Gunfire controls
Drone controls

A special guidance system for the Jupiter C, developed by the Army Ballistic Missile Agency, was used to launch the first U. S. artificial satellite into space.

Many components of this system were provided by Ford Instrument Co., prime contractor for both the "standard" U. S. Army Redstone and Jupiter guidance systems.

The fabulously-equipped, fantastically-clean gyro lab (above) is only a small part of the advanced research and development facilities available at Ford Instrument Co. They're used to create and produce the incredibly accurate control systems called for by modern technology in both government and industry.

And Ford Instrument's large-scale precision manufacturing facilities can turn even the most critical system requirements into working "hardware" on a quantity-production basis. Our Liaison Engineers are at your service to discuss your system requirements.

8.6

FORD INSTRUMENT CO.

DIVISION OF SPERRY RAND CORPORATION
31-10 Thomson Avenue, Long Island City 1, New York
Field Sales Offices: Beverly Hills, Calif.; Dayton, Ohio

by a coherent presentation in class of the fundamentals of modern automatic control, and by providing a comprehensive set of notes which will serve as a framework for further study.

The course is built around the principles and application of measurement, communication and control. The material will begin with the fundamentals in each of these fields and will include some basic work in nonlinear systems. This will be followed by applications of the fundamentals to more advanced problems.

There will be four hours of lecture each morning and three hours of laboratory demonstration in the afternoon. Extensive use will be made of computing, instrumentation and servo laboratories on the campus. The role of analog computing methods will be emphasized. This course has been given summers since 1953.

April 15 is the closing date for registration. Further information may be obtained by writing to Prof. L. L. Rauch, Room 1525 B, East Engineering Building, University of Michigan, Ann Arbor, Mich.

Research Group Sponsors German Ballistics Session

The AGARD Wind Tunnel and Model Testing Panel will sponsor a ballistics meeting in Freiburg, Breisgau, Germany, from April 22 to 25. Subjects will include the historical development of ballistics, high-velocity guns, range techniques and long-range missiles. Some 15 papers will be presented.

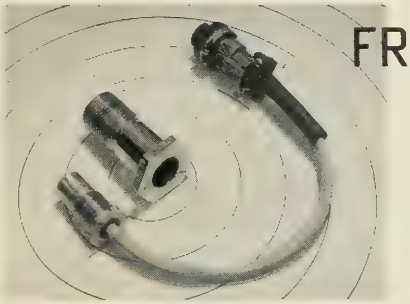
Scientific Progress Vital to Survival—Dr. Ramo

"Scientific developments in electronic computers and other synthetic intelligence devices may be more important in our race for survival than space supremacy," Dr. Simon Ramo, chief scientist for the Air Force ballistic missile program, said recently.

"Space conquest, intercontinental ballistic missiles—neither of these new technological advances would be possible without a multitude of instruments that extend man's senses; that observe and remember, compute faster and more efficiently than the human brain under similar circumstances," he added.

Speaking before the American Institute of Electrical Engineers in a special session devoted to "thinking machines" of the future, the president of Space Technology Laboratories said, "Total brain power of a nation in the coming half century is going to be the determining factor in that nation's

do you have these missile power problems?

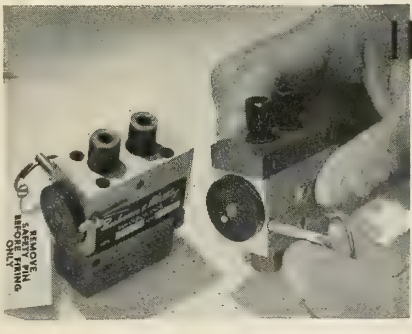


FRACTURING?

Frangible bolts from the Beckman & Whitley line combine the optimum in dependability and convenience for separating structures by electrical signal. Made to specifications, these bolts are internally threaded to receive the pre-wired charge which then attaches by standard connector to the missile circuitry provided. We'd like to help with *your* needs.

DISCONNECTING?

Double certainty of positive electrical disconnecting is provided by the selectively fired, two-charge design of this example from the line of Beckman & Whitley electrical disconnects. Shown assembled at right, this device can be provided with alternative primers as shown in the center. Shear pins hold the unaltered electrical connector assembly rigidly together until either or both primers are fired. Ideal for umbilical connections or other applications where guillotine choppers are not applicable. Perhaps these would help on *your* project.



INITIATION?

Same basic mechanism serves, right, as a detonator-safe primacord initiator, having a lanyard-operated safety pin; or, by the substitution of an explosive charge, bottom left, unit becomes a destructor. Two separate channels for top reliability, mechanism so designed that reinsertion of safety pin reverses unit from "arm" to "safe" position. If these sound too simple, we can show you some *complicated* ones.

Pre-packaged explosive power units provide higher reliability and greater power for a given weight and volume of space than any other actuation method. Some of the many other applications to valving, ejecting, fracturing, etc. may be interesting to you. Just ask us.

Beckman & Whitley INC., SAN CARLOS 16 CALIFORNIA

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until and after man conquers space...

Since time began man has sought to escape the limitations of the body. Though his feet are planted on earth he will climb to the sun. Today's jet pilot probes the upper reaches of the earth's atmosphere . . . tomorrow, manning vastly different craft he will conquer the final frontier — outer space.

As the demands of ship and mission go beyond human reaction, he will increasingly depend on the kind of pioneering, skills and products that have made the name Weatherhead synonymous with PRECISION for over a quarter of a century.

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- QUICK DISCONNECT SELF-SEALING COUPLINGS
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progress. However, that ability is not set just by the number of human brains in each nation, but rather how those brains are used and how they are assisted by synthetic intelligence devices.

"In every phase of our economy—engineering design, factory operations, communications, transportation, and in the military—we are making tremendous strides in the extension of human brains and senses," he said.

"For instance, I think we are ahead of the Russians today in the techniques that extend and make more useful each brain, each pair of eyes in our nation." Space Technology Laboratories is a division of The Ramo-Wooldridge Corp., and has as its primary job engineering direction of the overall missile systems, *Atlas, Titan,* and *Thor,* the Air Force's long-range ballistic missiles.

Automatic Test Equipment to be Made Under License

Automatic equipment for production testing of complex fire-control, flight-control and missile systems, developed by Westinghouse, will now be manufactured under license by Mason, Shaver and Rhoades Sales, East McKeesport, Pa.

The four basic automatic units involved in the licensing agreement are: a dc resistance tester, developed for high-volume testing of components such as transformers, which automatically bridge-tests items through a range of 0.001 to 10,000 ohms; a precision potentiometer tester which tests ganged computer-type potentiometers for resistance, terminal linearity, dielectric strength and electrical noise; a turns-ratio tester which tests the electrical relationship between the number of turns in transformers of multiple windings at a test rate of 15 seconds per transformer, and a flux-reset-type core tester for testing all types of magnetic amplifier toroidal cores.

Epsco System Used by General Electric

Makeup of the analog-to-digital subsystem in the GE missile and ordnance systems department's data-processing center has been described by its manufacturer, Epsco Inc., as a major advance in automatic data reduction. The subsystem forms part of the integrated computing facility described in the February issue of m/r.

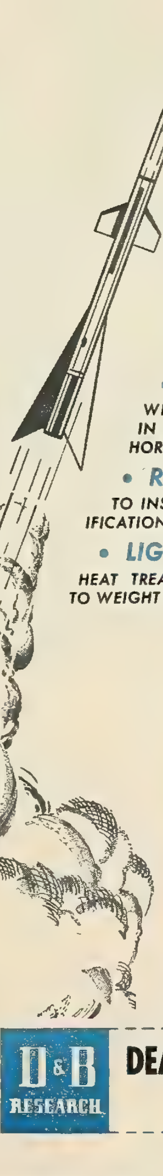
However, Epsco points out, even though this conversion subsystem was designed, built and delivered in less than 10 months through extensive use of modular techniques, new advances are already in the design stage.

The new technique uses Universal System Logic Boards—solid-state printed wiring circuits which may be combined without modification to comprise complete system logic for data-handling applications, from process control to telemetry data reduction. The use of such pre-engineered modules is, Epsco feels, the answer to improving electronic system reliability even in the face of increasing system complexity.

'Most Accurate' Radars Track *Explorer* Launching

When the Army's *Explorer* rose into its history-making orbit, its flight was followed by two of the most accurate tracking radars in the world, it was disclosed today by the Radio Corporation of America.

A number of these instruments, RCA vice president, A. L. Malcarney said, are currently being produced in



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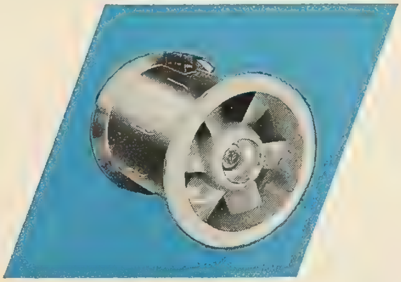
- **RELIABLE** — EACH BLOWER IS VIBRATION TESTED TO INSURE A STRUCTURALLY SOUND UNIT. COMPLETE QUALIFICATION FACILITIES WITHIN THE DEAN AND BENSON PLANT.
- **LIGHTWEIGHT** — WROUGHT ALUMINUM ALLOYS HEAT TREATED AND AGED PROVIDE A MAXIMUM STRENGTH TO WEIGHT RATIO.



Inquiries regarding existing or future applications are welcome and should be sent to:

D&B RESEARCH

DEAN & BENSON RESEARCH, INC.
16 RICHMOND STREET CLIFTON, NEW JERSEY
Phone: GRegory 1-1600

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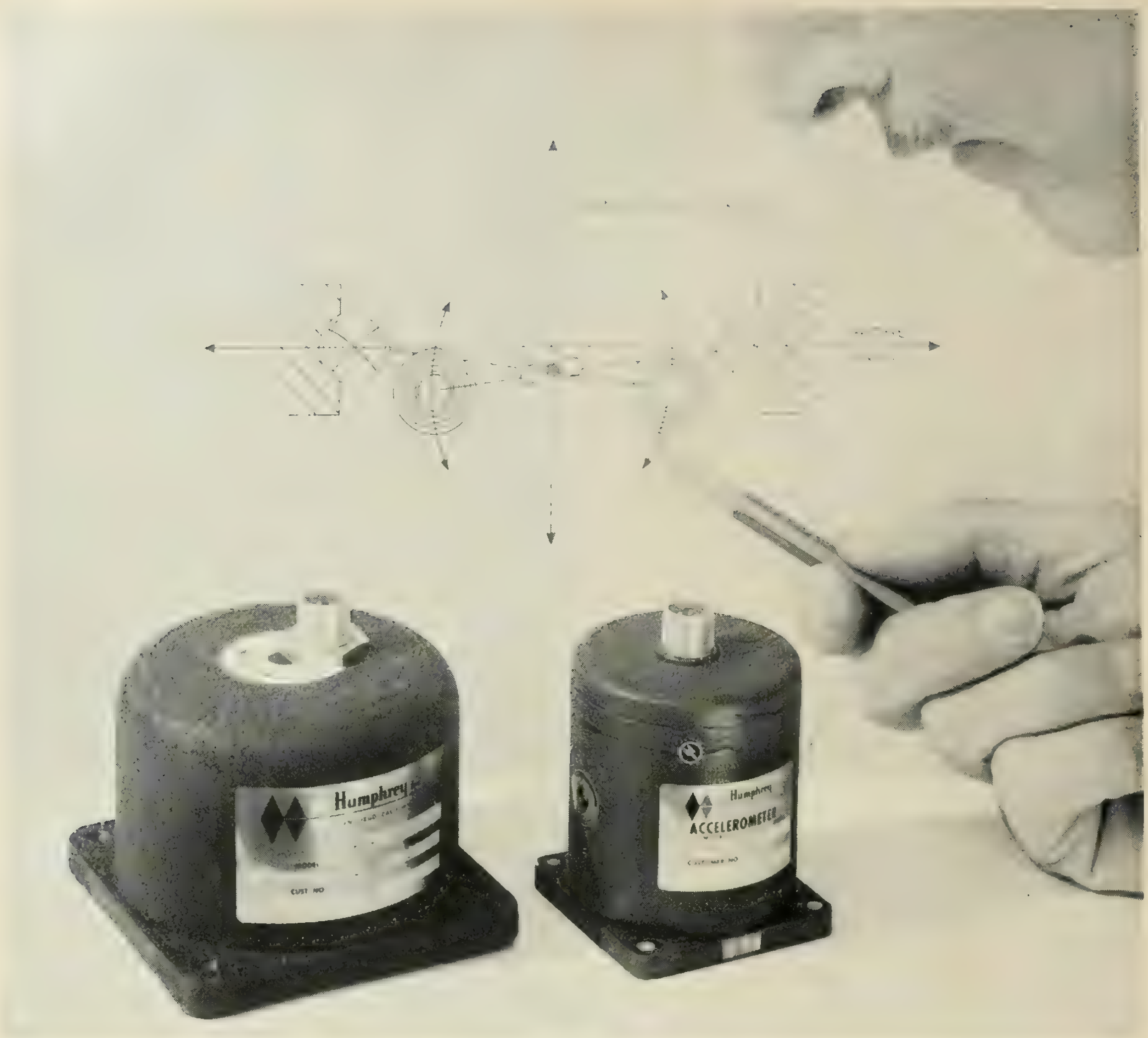

CONTRA-ROTATING WEIGHTS ELIMINATE CROSS TALK IN HUMPHREY ACCELEROMETERS

When an accelerometer used to measure motion of a body in one direction is influenced by motion in another direction, the resulting "cross talk" leads to inaccuracies. Humphrey licks this problem by building accelerometers that cancel out cross talk.

The diagram illustrates the principle. There are two contra-rotating weights on arms that are flexure mounted so they are free to move. Where the arms cross, they are pinned together with a slot and pin that allows them to move. Assume the accelerometer is measuring vertical motion as shown by the arrows. Lateral motion can't produce error in vertical measurement because "up" error of one weight is cancelled out by "down" error of the other. Flexibility of this design permits covering a wide range of operating characteristics. Low natural frequencies can be furnished to filter out mechanical vibrations. Let us work with you on your linear or angular accelerometer requirements. Write today.

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FOR COMPLETE SYSTEMS, SPECIFY HUMPHREY GYROSCOPES, ACCELEROMETERS, POTENTIOMETERS

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quantity for installation on Army, Navy and Air Force missile ranges throughout the country. They are the first specifically designed for guided-missile range instrumentation, and are the result of a ten-year program of research and development carried out by RCA in conjunction with the applied physics laboratory of Johns Hopkins University, the Navy Bureau of Ordnance and the Navy Bureau of Aeronautics.

"The radars, located on the Florida coast and on Grand Bahama Island, 165 miles away, provided information vitally necessary for the successful orbiting of the satellite," Mr. Malcarney said.

"The AN/FPS-16 is also used for tracking in the Army's *Talos* defense unit missile system, and is adaptable to most of the U.S. missile systems."

According to Malcarney, the radar development "was accelerated by the large-scale testing of guided missiles and the resultant need for providing fast, accurate, tracking data. The AN/FPS-16 tracks in total darkness, through clouds and at long range. Tracking data is almost immediately reduced to their final form. Previously, weeks were required to translate tracking data to intelligible form."

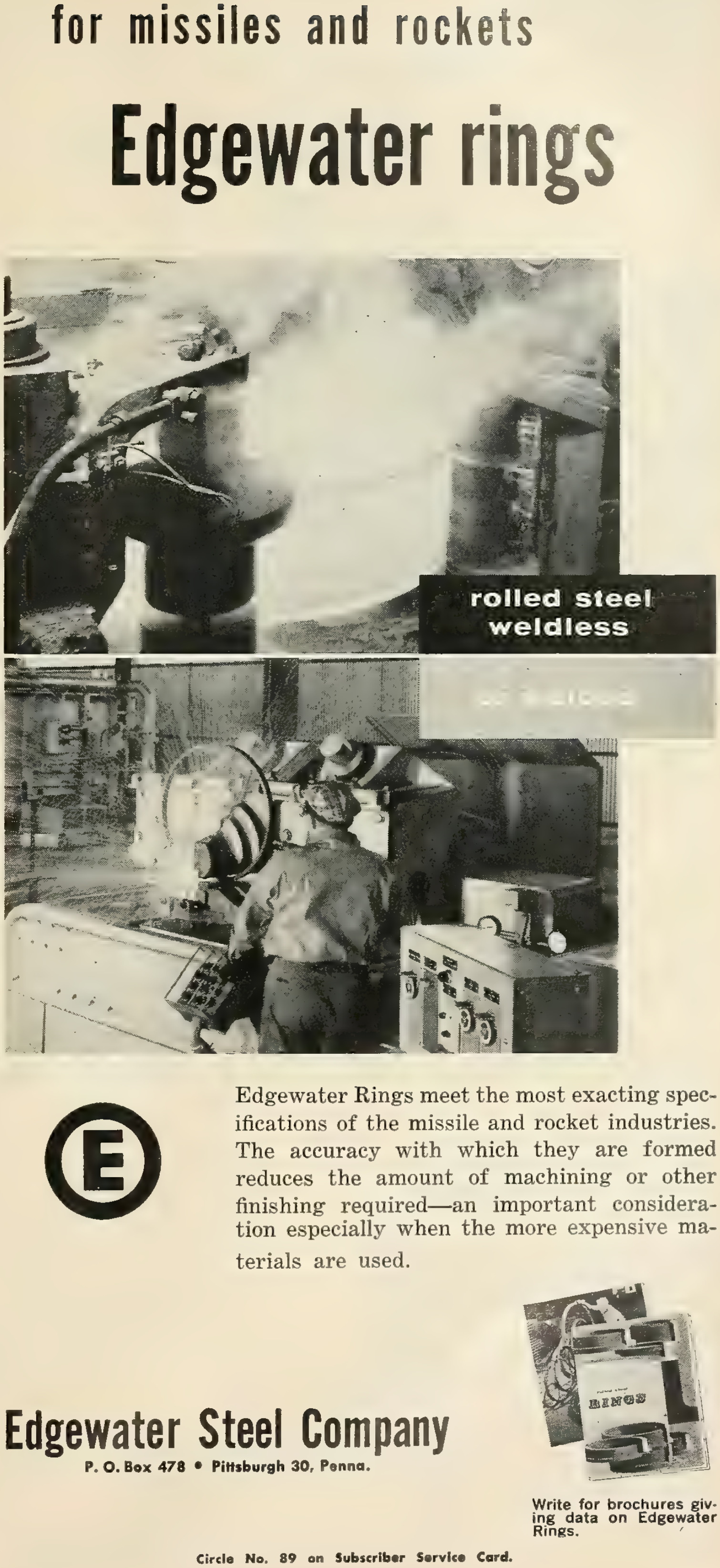
"Still another feature of this highly accurate radar" Malcarney said, "is its ease of control with only a single operator needed for each unit. It is also reliable, functional under all weather conditions, flexible and highly standardized for use by all three services, thus eliminating duplication of effort.

"Along with the more glamorous missiles that soar majestically into the sky every day, this precision radar is playing a tremendously important supporting role in the drama of national defense."

Market Guide, Directory Publication Set in April

The first annual edition of the Missile Market Guide & Directory will be published by American Aviation Publications, Inc., publishers of Missiles & Rockets, in mid-April 1958. This book, the only complete marketing directory of the missile industry, has been over a year in preparation and will cover all phases of this rapidly growing industry.

Included in the Missile Market Guide & Directory will be a marketing section outlining the procurement policies of the Department of Defense and the various services; an alphabetical listing by company of over 2500 prime contractors, subcontractors and equipment manufacturers showing plant



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Edgewater Rings meet the most exacting specifications of the missile and rocket industries. The accuracy with which they are formed reduces the amount of machining or other finishing required—an important consideration especially when the more expensive materials are used.

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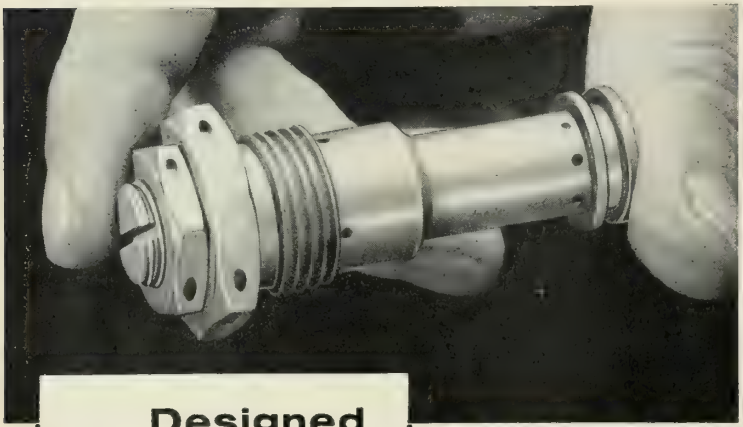
High Pressure
Pilot Operated
Relief Valves



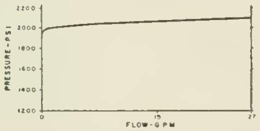
. . . Designed and Built To Meet Your Requirements

■ This typical Pilot Operated Relief Valve is just one of many hydraulic and fuel valves designed and built by FLUID REGULATORS for major aircraft accessory manufacturers. This particular valve controls the output pressure of a gear pump which is the source of power for flight control of a production missile.

Like all Fluid Regulator's valves, it meets the critical requirements of weight, size and dependability demanded by all missile applications.

Specialized knowledge of fluid power problems plus broad experience in meeting aircraft industry requirements, fully qualifies FLUID REGULATORS to design and produce control devices to meet your most exacting needs.

Typical Pressure-Flow Curve For Above Valve



TYPICAL SPECIFICATIONS:

- **Application:** Pilot Operated Relief Valve For Missile Flight Control.
- **Media:** MIL-O-5606
- **Pressure Range:** Adjustable to 4000 psi.
- **Capacity:** To 27 GPM.
- **Temperature:** —65°F to +250°F.
- **Construction:** Threads to mate ⅞ - 14 UNF. Working parts hardened stainless steel.

Fluid Regulators Serves the Aircraft and Missile Industry East of the Mississippi.

Designers and manufacturers of Hydraulic and Fuel Valves for Aircraft, Missiles and Other Exacting Military Applications

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location, purchasing & sales personnel, and products; and a completely cross-indexed missile catalog of over 4500 items that go into a missile and the companies that manufacture them.

Questionnaires have been sent to some 10,000 companies in the missile industry and the editors have advised that companies who have replied by March 8 can be included in the directory.

Copies of the MISSILE MARKET GUIDE & DIRECTORY will be distributed to all subscribers of MISSILES & ROCKETS as part of their subscription. Additional copies, at $5.00 each, can be reserved by writing to the Circulation Director, MISSILE MARKET GUIDE & DIRECTORY, American Aviation Publications, Inc., 1001 Vermont Ave., N.W., Washington, D.C.

Rocketdyne Awarded Nuclear Rocket Contract

Rocketdyne, under an Air Force contract, is conducting studies and research activities directed toward a nuclear rocket engine. The contract is administered by Wright Air Development Center and is in coordination with previously announced work of the Atomic Energy Commission.

The present contract extends pioneering work by North American in the nuclear rocket field. The nation's first studies and experimental research were carried out by the company as early as 1946.

Rocketdyne project engineer for the nuclear rocket studies and research activities is Dr. S. V. Gunn, a graduate of Purdue University who joined the North American division in 1953.

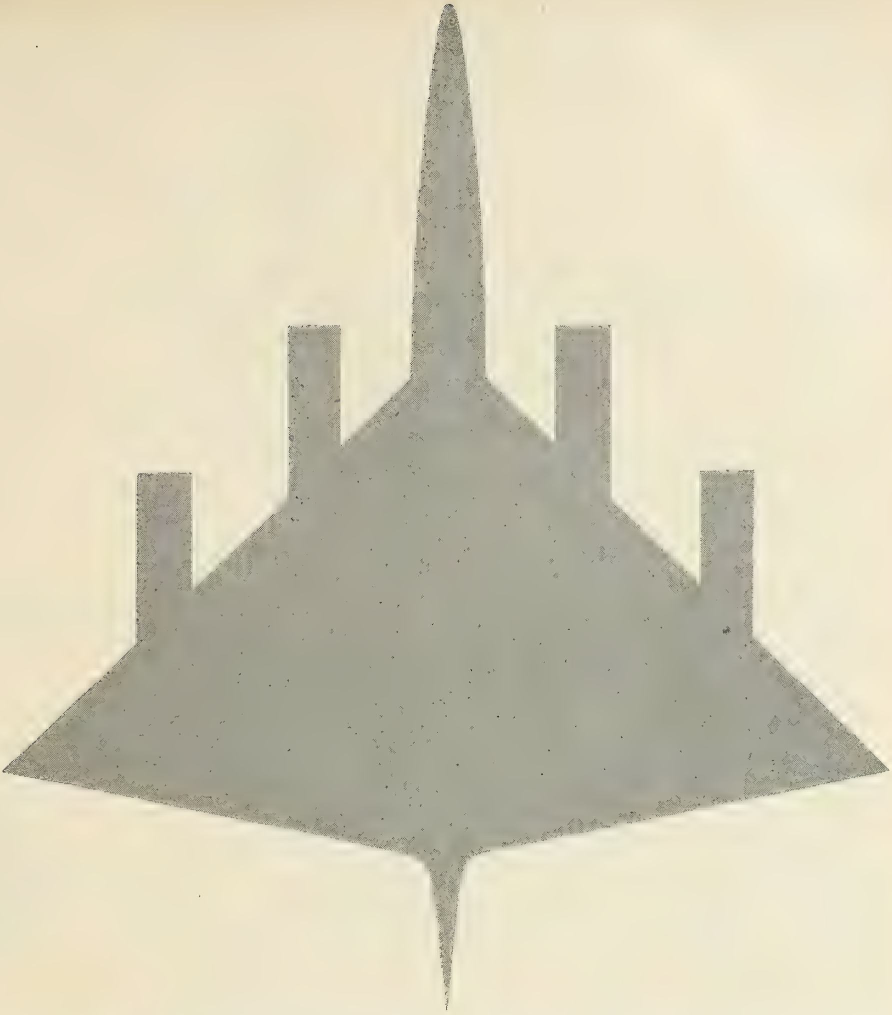
AF High-altitude Chamber Due for Midyear Operation

ALAMAGORDO, N. Mex.—Finishing touches are being placed on a new high-altitude chamber here at the Air Force Missile Development Center.

This test and research facility—two years abuilding—is expected to go operational around midyear. Under the high-altitude division of the Directorate of Ballistic Missile Test, the new facility is slated to further extend the frontiers of men and missiles into space. Altitudes of 140,000 feet can be simulated but the capacity can be pushed to 250,000 feet.

Function of the chamber is to check out large components of vertically launched rockets, high-altitude balloon chambers, and other packages, under simulated and reproducible conditions for periods of as long as 60 days.

Unique feature of the chamber



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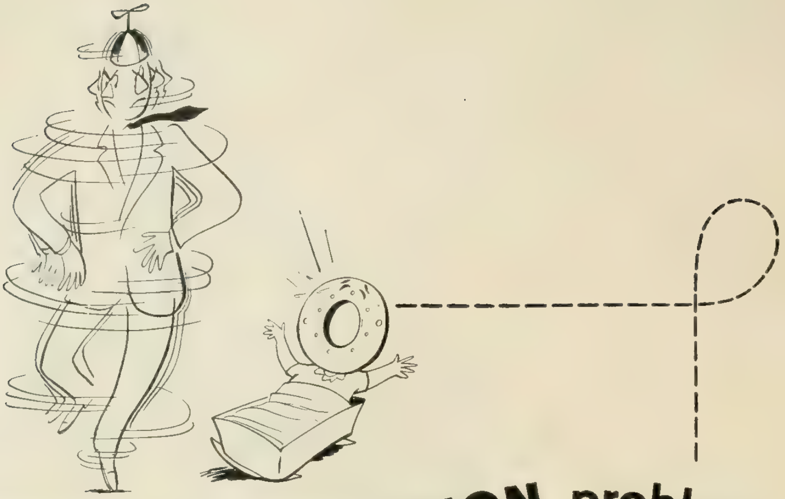

a FRETTING-CORROSION problem had him in a spin

Finding a wear-resistant coating for turbine engine shaft seals posed a serious problem for an aircraft engine manufacturer. Even the hardest alloys were subject to fretting corrosion and had to be replaced after a few hours of service.

This fretting-corrosion problem was solved by having the bearing surface of the seal Flame-Plated by LINDE. By this special detonation process, particles of tungsten carbide are literally *blasted* onto almost any metal surface. Most important, the temperature of the part being plated never exceeds 400° F., so there is little chance that the base metal will warp or that its metallurgical properties will be changed. Flame-Plated tungsten carbide coatings can be applied in thicknesses from .010 to .002 inches. Coatings can be used in the as-coated condition (125 microinches rms) or ground and lapped to a 0.5 microinch finish.

If your design involves metal parts subject to extreme wear, heat, or fretting corrosion, perhaps Flame-Plating can eliminate some or all of your "headaches"—or make possible some completely new idea.

To find out, write us about your wear problem or request a free copy of LINDE's booklet, "Flame-Plating," F8065. Address Flame-Plating Department.

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is the automatic programming capability of simulating pressure, temperature, humidity and solar radiation environmental characteristics encountered in flight of rocket missiles and high-altitude balloons. With an eye to space biology, infrared radiation production and control has received special attention.

Inside-chamber work space is 8 feet wide by 8 feet high by 11 feet deep. Main access door—monorail hung—is 8 feet by 8 feet and opens one entire side of the chamber. Chamber lighting, designed for near-vacuum conditions, gives an intensity of 30 foot candles. The floor can take loads of up to 450 psf while 1,200 pounds can be hung from the ceiling. An anteroom provides an air-lock method of entering or leaving the main chamber without test cycle abortion.

Various utility penetrations are provided—including three window ports. Four oxygen outlets are located in the chamber itself with another outlet in the anteroom. An intercom and electrical patch system are also provided.

Instrumentation includes recorders for dry bulb temperatures, wet bulb temperature, dew point temperature, and two altitude recorders. All of the instruments are made up of two prime components: a programmer strip-chart instrument, and a recording strip-chart. The programmers are the curve-following type, utilizing a photronic cell and light-beam principle.

Curves are plotted on a strip chart to program any cycle or series of cycles within the capacity and ranges of the chamber machinery. Automatic digitized logging equipment is associated with the chamber instruments and will type out a readout and punch IBM type.

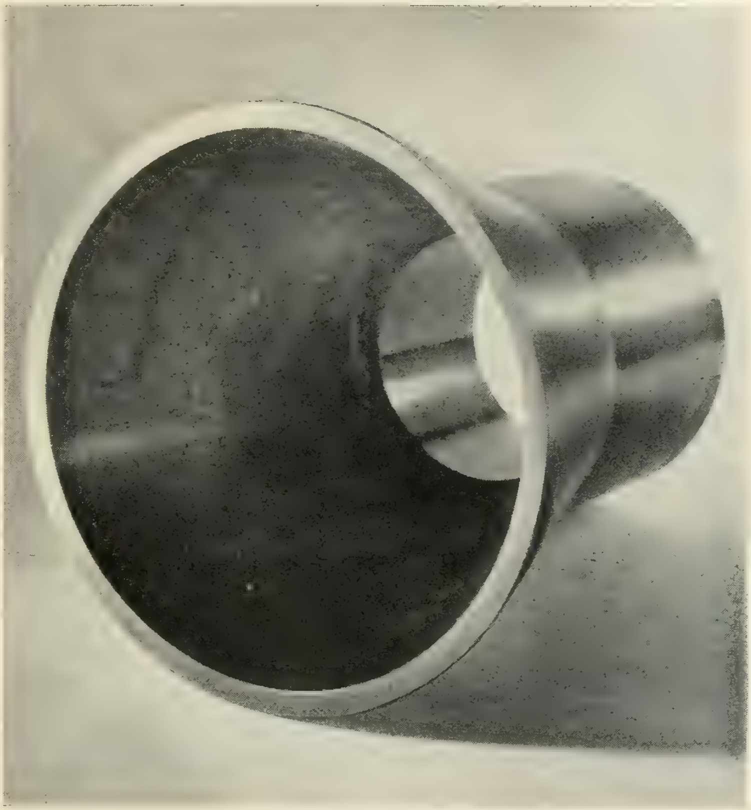
Housing for the chamber is a concrete masonry structure. The main test-chamber space is 44 feet by 40 feet with 16 feet (clear) of ceiling. Evacuation system consists of three 900 cfm pumps. Refrigeration system (cold wall) uses Freon-22. High stage is 40 hp while the two lower stages are 25 hp each. Heating space is electrical. The normal complement of persons regularly assigned to operate the facility are an Air Force officer, a civilian mechanical engineer, an instrumentation specialist, a refrigeration mechanic, four operators and a secretary.

Performance capability of the chamber is:

TEMPERATURE. –100°F to 200°F. With a one-ton workload, the air temperature can be lowered from 80°F to –100°F in four hours at ambient altitude pressure or raised to 200°F in 20 minutes. Cold wall temperatures of –100°F can be obtained

Do you have a hot throat problem?

Solution: R/M PYROTEX REINFORCED PLASTICS



When missile temperatures rise as high as 10,000°F, and you have to meet structural as well as thermal insulation requirements, your problem is a big one. You have an excellent solution: R/M Pyrotex—a complete line of asbestos-base reinforced plastic materials.

The rocket exhaust throat shown here is an example of what these important new R/M materials can do for you. They provide exceptionally high strength-to-weight ratios, take a smooth finish, and can be mass produced to precision standards. Other missile parts for which R/M Pyrotex has been selected: nose and exhaust cones, blast tubes, grain seats, fins and combustion chamber liners. If heat extremes are part of your problem, it will pay you to get more details on R/M Pyrotex!

For further information, write for technical bulletin

RM

RAYBESTOS-MANHATTAN, INC.

REINFORCED PLASTICS DEPARTMENT, Manheim, Pa.

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in one hour at altitudes of up to 140,000 feet. Some 8 kw of electrical energy can be dissipated at –100°F. Dry bulb temperature accuracy is to ±0.75°F.

HUMIDITY. Relative humidity can be increased from 5%-100% at 33°F to 200°F. Humidity can be increased or decreased 5%-95% at 200°F in two hours. Overall humidity accuracy is ±3% RH.

ALTITUDE. Range is from location (4100 feet) to 140,000 feet. With ideal conditions it may be possible to obtain 250,000 feet. Rate of ascent is 4100 to 140,000 feet in three minutes and 23 seconds. Maximum descent is 50,000 fpm with the controller or emergency descent from 140,000 feet to ambient in 30 seconds. Altitude accuracy is ±1% from 0 to 100,000 feet or ±2% from 100,000 feet to 140,000 feet.

The chamber is available for use by any Defense Department agency or private industry engaged in defense contracts. Normal users will be Air Force groups engaged in upper-atmosphere research and Air Force guided missile contractors.

Reliability Films Sponsored by U.S. Navy

The Bureau of Ordnance, U.S. Navy (ReS1) is currently soliciting suggestions to illustrate given points or principles in a series of sponsored films on the aspects of reliability. The series will consist of nine films and work has already begun on the first two. The films will be unclassified and will be available for use by universities as well as industry and the military. The Navy hopes that scholastic use will be a means of reaching the graduates who enter the government and industry each year, providing them with some advance consciousness and awareness of the importance of reliability.

Basic concept of this series is that, to achieve high reliability, it is necessary to start with the people who constitute the maker-user team and to inform and educate in a manner that will develop mental attitudes and approaches focused toward high reliability.

Titles for the films planned range from: "Why So Much Concern," "Basic Steps and Procedures in Planning," "Design Approaches," on through to the final title, "The Maintenance Factor."

Mr. P. R. Wheeler, BuOrd, states that suggestions will be welcome so that the films will have maximum appeal and effectiveness. All correspondence should be addressed to the Bureau of Ordnance, ReS1, Department of the Navy, Washington 25, D.C.

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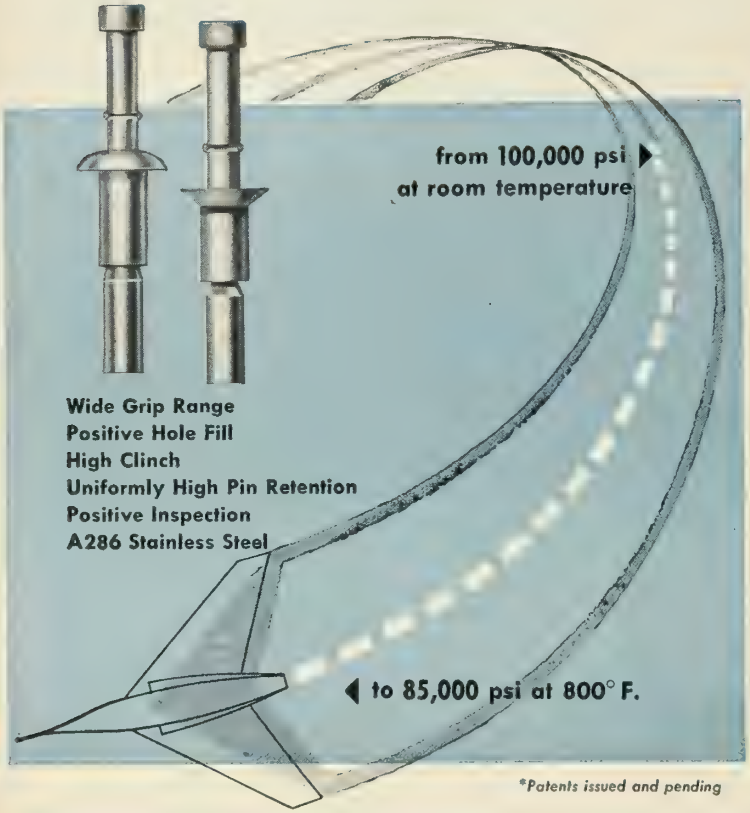
for Hi-Strength
at Hi-Temperature
the Cherry
"600" Rivet*



*Patents issued and pending

To meet the design requirements imposed by extremely high-speed aircraft and missiles, the Cherry Rivet research and development department has introduced the "600" A286 stainless steel blind rivet.

Data on the strength capabilities of the "600" rivet is available from Townsend Company, Cherry Rivet Division, P.O. Box 2157-Z, Santa Ana, California.

CHERRY RIVET DIVISION
SANTA ANA, CALIFORNIA
Townsend Company
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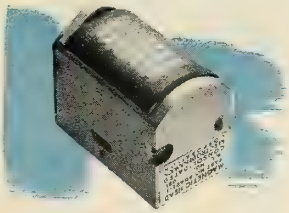
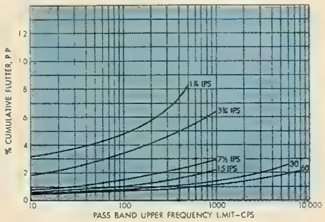
all-metal-surface magnetic heads

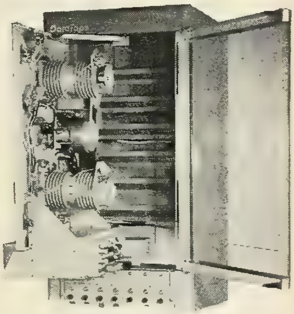


No more drop-outs or loss of high-frequency response because of oxide build-up on heads. All-metal-surface... rather than conventional metal-plastic combinations... promotes a self-cleaning action and minimizes head wear.

lower flutter even at low tape speeds



Cumulative flutter at 1⅞ and 3¾ ips is approximately one-half that found in other tape equipment. CEC is first to achieve the low-speed flutter characteristics shown at left. Chart shows flutter recorded at 30 ips and played back at speeds indicated.



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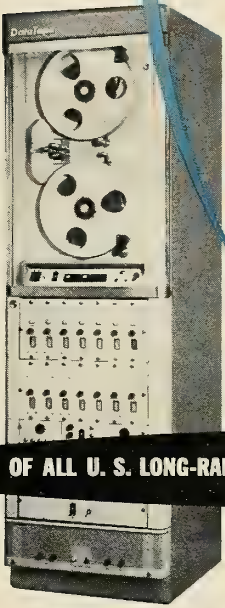

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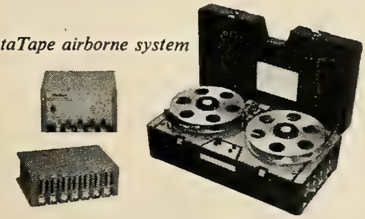

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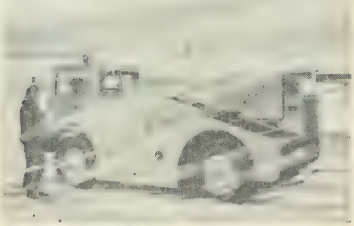

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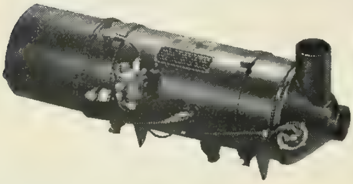

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Soviet Affairs

by Dr. Albert Parry

Impressions gathered on my recent lecture tours of the Northeast and the Middle West, both in the United States and Canada, include a curious popular misconception on the subject of the German role in the Soviet rocket effort.

Many Americans and Canadians are sincerely convinced that the Soviet successes in rockets and missiles are due predominantly, if not entirely, to the work of German experts captured or contracted by the Soviet Union at the end of World War II.

On one occasion in Cleveland, I had carefully explained that only a small portion of the Soviet achievements in the space race can rightfully be credited to German help when a listener ventured this interesting psychological explanation of the misconception:

"We Americans remember so well that we licked the Germans twice—in World War I and World War II. Now, consciously or not, we tell ourselves that it isn't really the Soviet Russians but the very same Germans who are again trying to challenge us. The same Germans, but in the guise of Red Russians! And we reassure ourselves that just as we licked the Germans in the two World Wars, we will lick them a third time, if there is a third time."

This popular American picture of Germans-in-the-guise-of-Soviets has already reached Khrushchev. Outraged, he found it necessary to deny the charge in his recent Minsk speech. Nikita pointed out that while Germans had indeed been used by his government in rocketry and other scientific and engineering fields, it was only "a small group of Germans," and that "on the termination of their contracts they have either returned or are now returning to Germany."

Moreover, Khrushchev emphasized the role of Germans in the U.S. rocket field. Following his lead, the Soviet press at once began to stress the number and importance of such German experts in American service as Dr. Wernher von Braun and his associates.

•

The successful launching of our *Explorer*, under von Braun's guidance, is now being used by the Soviets in their own version of America's post-*Sputnik* game: "It is Germans, not Americans, who produce whatever rockets, missiles and earth satellites the capitalist world has!"

To use the psychological explanation of the man in my Cleveland audience, by this time the Soviet Russians may also be guilty of the same attempt at self-assurance and saying in effect: "We Russians licked those Germans in World War II (if not in World War I). We will lick those Germans again even though they assume the guise of Americans on that Cape Canaveral base!"

Another self-consoling illusion I found among my American and Canadian audiences appeared in the form of a question I was frequently asked: "Isn't it true that most Russian scientists in the rocket and atomic field are men in their fifties, sixties and even seventies? Doesn't this mean that younger Soviet scientists and engineers are not as good as they are often described—that they cannot continue the successes of their elders and therefore are of no real competition to the West?"

My answer, of course, was that there is plenty of young blood among Soviet rocketeers and nuclear physicists—that under no circumstances must we lull ourselves into any false sense of security on this score.

Moscow Briefs

From October 4 to January 18, a total of 91,569 letters and wires, addressed "Moscow—*Sputnik*," was received by the Soviet Academy of Sciences. This number includes letters, postcards and wires from 58 foreign countries. In addition, more than 300 packages arrived containing photographs, tapes and records registering both *Sputnik*s in picture and sound. Nearly 1300 persons, from both Russia and abroad, wrote volunteering as passengers on the first Soviet flights of the future into outer space, particularly to the Moon.

•

Radio Moscow has begun making space flight programs a regular part of its diet served to North America. The broadcasts give general descriptions of a wonderful era ahead, in which there seems to be a complete absence of any ideological or other conflicts.

•

The initial claim of "Soviet military and scientific superiority" because of their ICBM and *Sputnik*s has been played down in the Russian press. The fact that these events jolted the United States into beefing up its defenses has led the Soviets to change their line and claim that our reaction is due to U.S. "failure to understand the real aims of Soviet science."

•

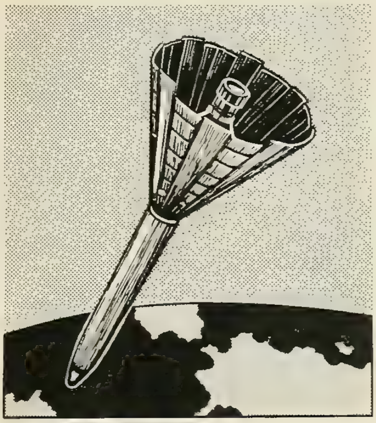
The Soviet Union expects to "hold the first place in the world in the peaceful use of atomic energy by 1960." This is one of the chief points made in the book The Year 1960 by L. V. Zhigarev, just issued in Moscow by the State Political Literature Publishing House. Atomic-energy stations will dot the entire country, says the author, but in the south of the Soviet Union there will in addition be a network of solar powerhouses, creating "a veritable revolution in industrial energy."

•

The Moscow Mint is preparing a special miniature emblem in honor of *Sputnik* I, to be worn in coat lapels, apparently by those Soviet scientists, engineers, and officials who contributed to the satellite's creation and launching. The emblem shows a globe ringed by a fine strip of gold representing *Sputnik* I's orbit. The satellite itself is marked by a small red spot on the gold strip.

•

"Sovetskaya Aviatsia," the official newspaper of the Soviet Air Force, has been paying respectful attention to American ideas and research that tends to discard the sharp nose cone of a rocket or ICBM in favor of blunter shapes for re-entry purposes. These blunt shapes, the article notes, have a much better chance of surviving the plunge through the atmosphere at re-entry velocities. A recent article in the publication was accompanied by the above illustration and gave approving treatment to blunt-nose rocket projects.



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A vicious attack on Dr. Wernher von Braun was published by the Moscow *Komsomolskaya Pravda,* the official organ of the Communist Youth League, on January 26, or five days before the *Explorer* went up into its orbit.

Entitled "Father of V-2, Servant of Hitler and the Pentagon," the prominently featured article included two photographs, one showing Dr. von Braun in the early 1940s present at a tour of inspection by some Nazi generals, the other—a recent photo—showing him at a conference with American generals and officials at Huntsville.

The article, signed by I. B. Biryukov, charges that just as Dr. von Braun used to answer Nazi greetings by exclaiming "Germany Above All!", so now he shouts "Wall Street Above All!" The Soviet writer declares that Dr. von Braun tries to be "a faithful Columbus" with his discoveries for American rocketry, but that "he is no prophet" and is therefore wrong in predicting victory for the United States over the Soviet Union "and the world."

Dr. von Braun is invited by the *Komsomolskaya Pravda* journalist to "remember his defeat of 1945" as a lasting lesson for his part in the American race against Soviet rockets and missiles.

•

The death of Dr. Sergei V. Orlov, one of Russia's oldest and most famous astronomers and astrophysicists, has been reported in Moscow. A professor at Moscow University, Orlov was the author of many works on comets and other subjects. Director of the Shternberg Astronomical Institute attached to Moscow University, he was known not only for his scientific achievements but also for his training of numerous young Russian astronomers and astrophysicists now serving all over the USSR. Dr. Orlov was 77 at his death.

•

The Moscow "Literaturnaya Gazeta" castigates Professor S. F. Singer of the Physics Department at the University of Maryland in a special unsigned article entitled "Atom Warmongers in Outer Space."

While recognizing Professor Singer "for his works in the field of astronautics," the Russian article attacks his "report at the International Congress of Astronauts in Barcelona of last October wherein he advocated moving H-bomb tests from Nevada to the Moon."

The Soviet writer sees in this project "an opportunity for an unlimited increase of the might of nuclear arms, which is a fond dream of the gentlemen of Washington."

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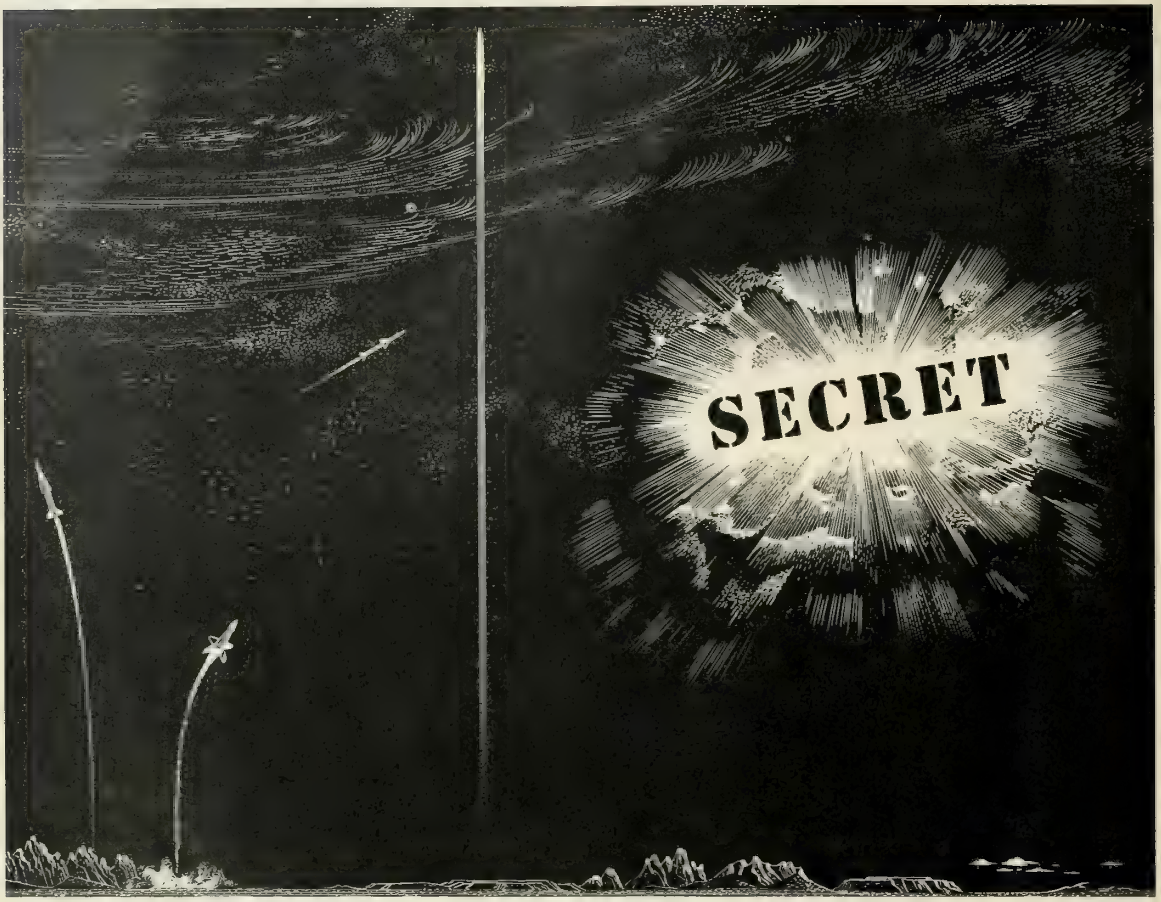

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Precision Instruments Are Core of Rocket Test Track

ALAMAGORDO, N. Mex.—The new 35,000-foot rocket track at the Air Force Missile Development Center will make extensive use of precision and versatile electronic instrumentation in its test program.

The purpose of the track is to collect data on the performance of missile and aircraft components, but because the average run will take only a few seconds, and because it will involve thousands of dollars in components, propulsion, and engineering man-hours, the collecting and recording data has to be of the highest quality. A vast net of ground lines, coax cables and radio links joins the blockhouses (3), firing pads, and instrumentation sites to the control and central data-collection building.

Each run requires the measurement of velocity and position of the rocket sled as a function of time. Standard equipment measures velocity with an error of not over one part in 1000 while position can be determined to ±0.1 inch.

Most tests use a permanent space-time system which consists of a small light source and a light-sensitive element carried on the sled. When the light beam is interrupted (by accurately spaced knife edges as the sled passes) a signal is telemetered to the data center where it is correlated and recorded.

For more accurate measurements, a sled-mounted accelerometer in conjunction with space-time data are fed into a computer. The computer processes the data and calculates velocity and position automatically, allowing for the changing travel time of the signal as the sled changes position relative to the data center.

Because of the more extensive data needed during a sled run, telemetry is required. Two telemetry signals are used:

The frequency modulation (FM/FM) system receives and presents transducer data in continuous form with a frequency response up to 3 kc on the upper channels; overall accuracy is over 94 per cent. Accuracy can be increased to 98 per cent with automatic calibration.

The other system, PCM, can hit an accuracy of 99.8 per cent. Here, the analog transducer output is sampled by sled-mounted equipment and converted into digital form for transmission over the PCM system to the data center for recording.

Missile Business

by Seabrook Hull

First there was the sound barrier; then, the heat barrier. Now, in the business of missiles, rockets and space flight another barrier rises: the dollar barrier. Simply put, the question of mounting concern in Washington is "Can we afford it?" And that's a dilemma that may well explain the delay in getting the country off top dead center in its efforts to catch and leapfrog Russia in advanced weaponry and modern technology.

The inescapable fact is: If you take all the programs and projects now pushed as essential and their costs, you come up with a total that gets frighteningly close to the $1-trillion mark. It would not be hard to budget "essential" projects requiring an annual expenditure equivalent to our entire national debt of some $275 billion.

Politically, the public would not stand for the taxes necessary to a pay-as-you-go approach, even assuming we had the scientific and engineering manpower to go around—which we don't. Economically, the country would collapse under any effort to finance it with massive deficit spending. It means that from the point of view of economics spending must be kept down to within "reasonable" levels—say, to $1 billion or less (corrected for inflation) for the whole national budget for some years to come. Politically, the practical total is probably closer to $75 billion—unless and until Russia does something else to scare us.

In terms of programs, it is therefore inevitable that many will be put on the shelf or dropped entirely. It should also mean that duplicate-but-competitive approaches (like *Thor* vs. *Jupiter*, *Wizard* vs. *Nike-Zeus*, etc.) will probably be rationalized down to a single survivor. It could even mean, for example, the cancellation of *Titan,* on the theory that *Atlas* will fill the gap until the solid-propellant ICBM comes along and that we simply can't afford the interim-though-sophisticated liquid-propellant *Titan*. Conversely, of course, it might mean dropping *Atlas,* should *Titan* suddenly show great troublefree promise in flight test.

It takes only simple arithmetic to see the reasoning involved. Though a comprehensive listing of missile-age prices is still a closely guard military secret—on the theory that contracts divided by unit prices give numbers ordered—enough has been released and/or surmised to demonstrate the present costliness of missile and rocket weapon systems.

One military estimate of the number of *Bomarc*s and their sites needed to fully protect this country rounds out at around the $10-billion mark; a single operational ICBM squadron, at about $1 billion. *Polaris*-launching submarines cost, in production, $80 million each without missiles, according to preliminary estimates. And, there's serious talk of building 100. The anti-missile missile will cost at least $1 billion just to develop, much less place in operational status. Ordered-in-volume air-to-air missiles range in price from $1200 to over $50,000 each, not including those with nuclear warheads. And, we haven't even begun to price a progressive space flight program! Nor have we included maintenance costs, pay and allowances for troops, industrial mobilization, education, etc.

A sharp thinking-through of our current and future military and space flight program is dictated not only by the limited dollars available, but also by limited, specific industrial capacity (forging and heat-treating, for example), and by the short supply of technical manpower.

In a word, the United States is forced to abandon the shotgun approach. Instead it must be highly selective—a new experience. This will have a profound affect on the missile business and should help provide an explanation for some of the "rather odd" decisions that may come out of Washington.

washington trends

by Elizabeth Oswald

A NEW STEP IN THE PLAN to develop an orbital bomber is expected "pretty soon." In Air Force parlance "pretty soon" means from two to three weeks, up to possibly six months.

Study is being made of proposals submitted by major aircraft companies, one from Bell Aircraft, first in the field to study under AF contract the possibility of using powerful rocket engines to boost an aircraft into space, at which point the pilot would take control. The vehicle would be capable of bombing any place on earth from outer space under pilot control, reentering the earth's atmosphere by use of a skip-glide technique.

ARDC officials are not convinced the project is feasible after studying proposals from Douglas Aircraft, Bell, North American Aviation, Northrop Aviation and Republic Aircraft. What could come next is a phase I design competition. Boeing Airplane Co. also has made a study of an unmanned ballistic rocket bomber for televised reconnaissance work.

ARMY-AIR FORCE BATTLES over the roles they will play in the development and operation of air defenses aren't over. Air Force wants a new look taken at the Defense Department decision which calls anti-missiles a "point defense" function, and gives the Army the job of developing *Nike-Zeus* as an anti-missile missile. AF claims that the missile can't properly be separated from its radar command and tracking equipment or its detection equipment. As of now split responsibility exists with AF responsible for the development of the detection equipment. It will also argue that a "point defense" weapon would require astronomical numbers of men and locations to protect such cities as New York or Los Angeles.

USE OF THE FIRST AIR-LAUNCHED solid-propellant ballistic missile may come with the production of the WS-110A, now known as the B-70. Chances are that the missile will not be a "sawed-off *Polaris*." Current thinking is that the WS-110A will carry both air-to-ground missiles and an intermediate-range ballistic missile. The air-to-ground missiles would be slung under the wings, with the ballistic missile carried in the bomb bay. This way, the Strategic Air Command expects to be able to pick off more than one target on each mission.

UPPER AIR RESEARCH conducted by the AF's Cambridge Research Laboratory is responsible for a big, and expensive project which is scheduled to continue until February 1, 1960. The balloons start at the Navy auxiliary field at Vernalis, Calif., and are scheduled to float east. Some of the bigger balloons reportedly will stay up for about 10 days. Details of the program are classified.

NEW PUSH FOR CONSTRUCTION of 100 submarines to carry the *Polaris* will run afoul of the limited submarine construction capability which now exists in the United States. Lead yard for such construction is that of the General Dynamics Electric Boat Co. at Groton, Conn., which will build two of the first three *Polaris* submarines. Other yards with a submarine capability are Mare Island which will build the third *Polaris* sub, the Naval Shipyard at Portsmouth, N.H., Newport News Shipbuilding Co., Newport News, Va., and Ingalls Shipbuilding Co., Pascagoula, Miss. The accelerated submarine construction program will take just under two years to produce its first submarine.

ROY W. JOHNSON, CHIEF of the newly created Advanced Research Projects Agency, won't have any fix on what the new organization will be until after April 1, when he comes to Washington full time. As of now his only certain needs are a top-notch scientist who, he says, won't come from General Electric Co., and a military assistant.

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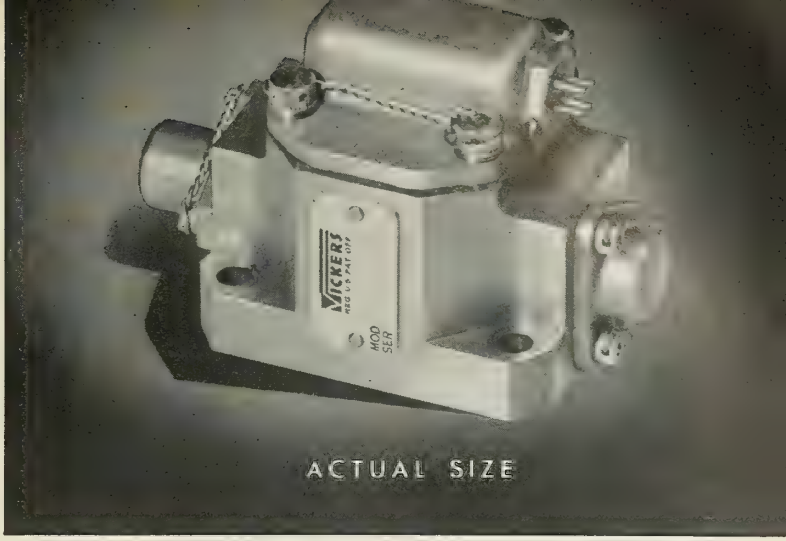

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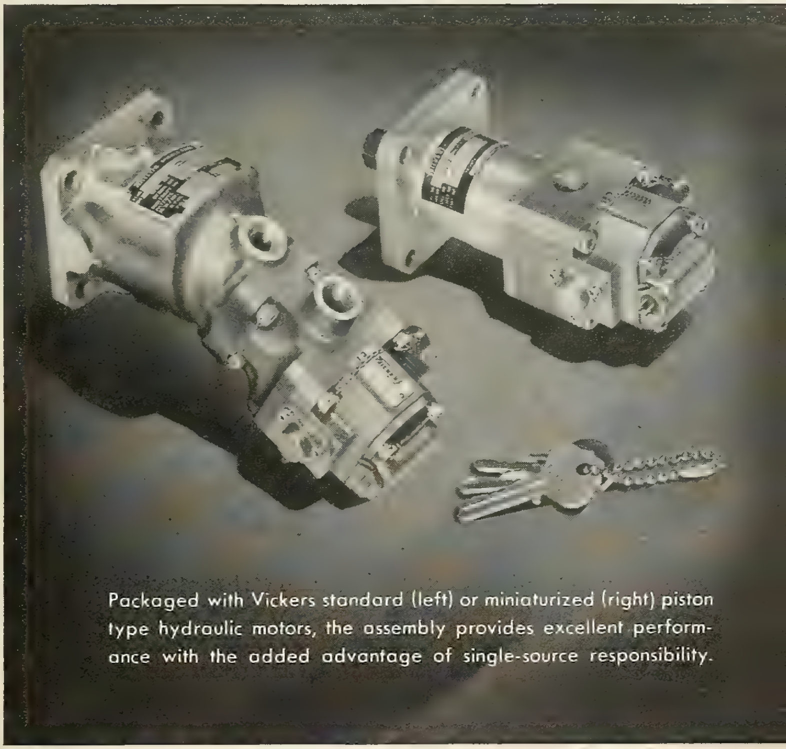

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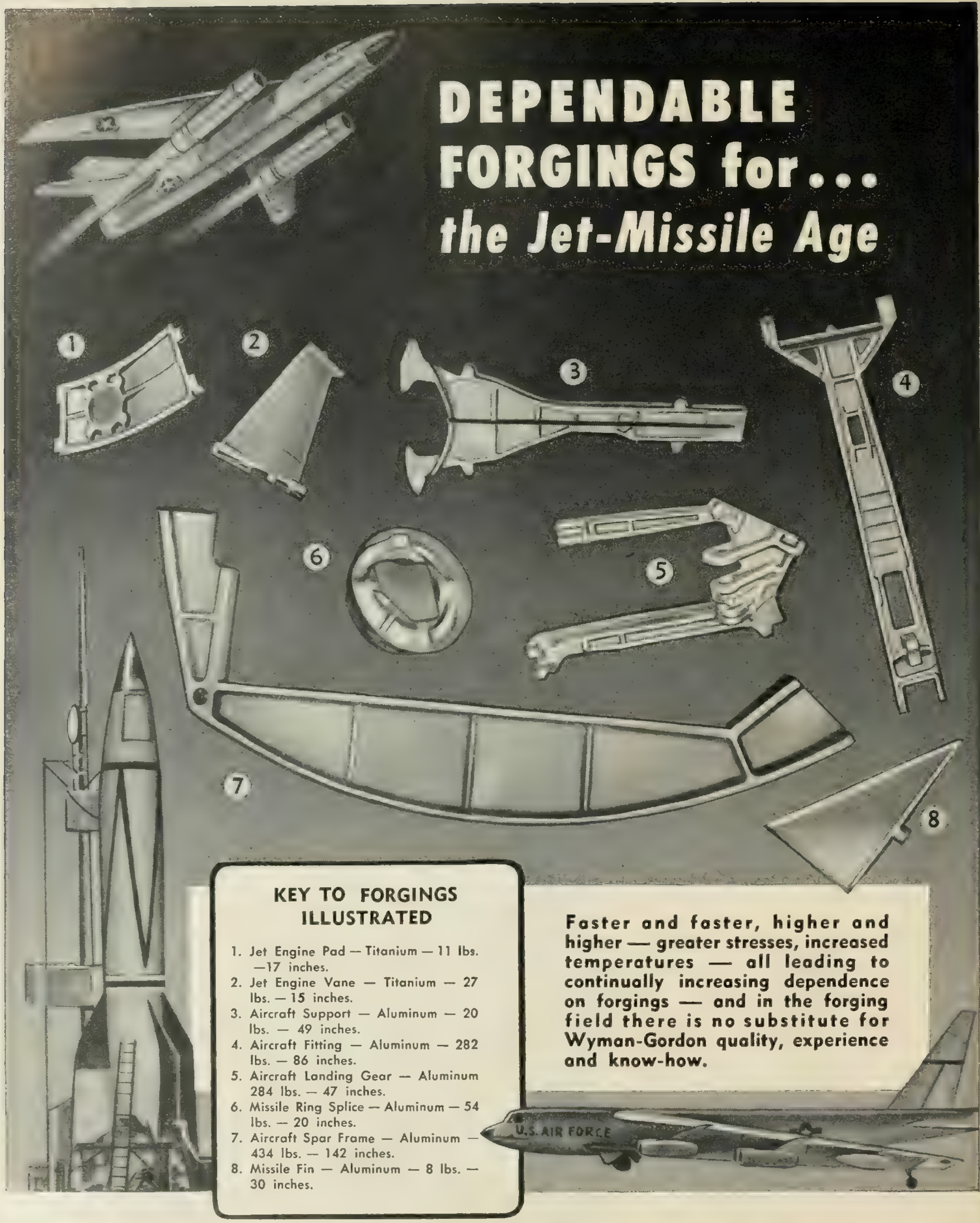

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VOL. 3 NO. 3

MARCH, 1958

missiles and rockets

MAGAZINE OF WORLD ASTRONAUTICS

1958 Missile Materials Review

a report on industry use and development of present and future materials

by Alfred J. Zaehringer and Raymond M. Nolan

TODAY THE AMERICAN missile industry has available a myriad of missile materials, many of which existed only on paper 10 years ago. Others, specifically developed for missiles, are, in some cases, only a few years old. Newcomers in the missile business expect this wide variety of materials, but oldtimers are prone to overlook some of the amazing properties available.

Day by day, new products are rapidly being added to this materials spectrum. These materials developments, coming at a critical time in our race with the USSR, now offer us two choices: we can take advantage of the ready availability of the new materials to offer superior missiles, or we can let these new materials fall by the wayside and thus fall even farther behind the Soviets, who are exploiting every conceivable new material and technique.

The key materials categories reviewed in this issue will be the old standby metals, the newer missile-age metals, the fast-moving plastics, ceramics, nuclear shield materials, and materials for lubricants and hydraulics.

Missile Metals

In the early days of rocketry, the fabricator was likely to make his rocket from any old chunk of steel or aluminum lying in the bare stockbin or in the scrap heap. Pre-World War II philosophy (and to a lesser extent during the war) seemed to be that the

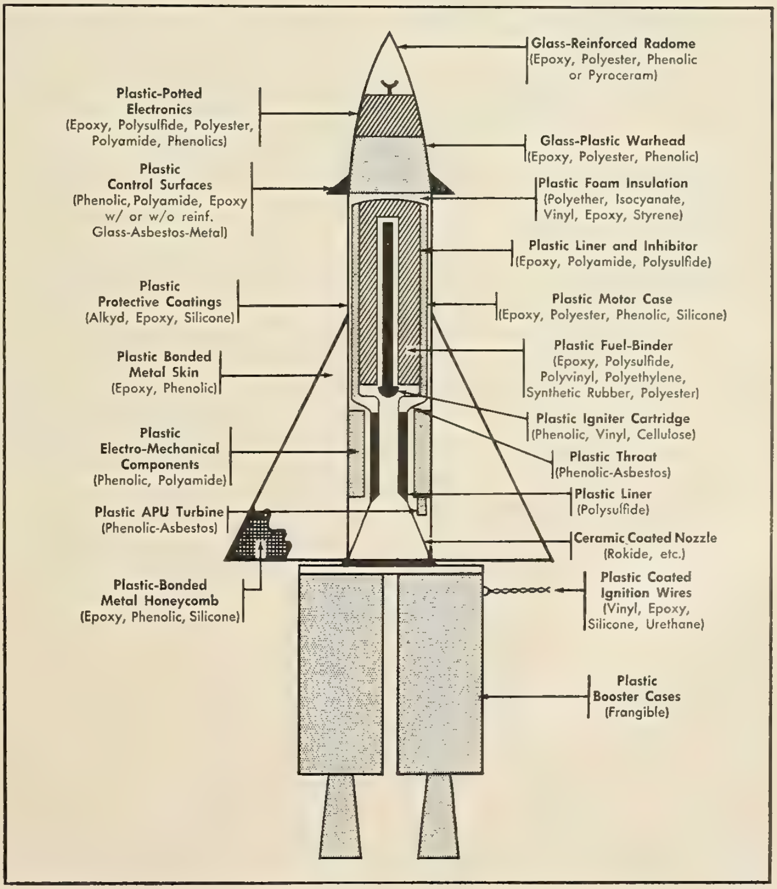

Glass-Reinforced Radome (Epoxy, Polyester, Phenolic or Pyroceram)
Plastic-Potted Electronics (Epoxy, Polysulfide, Polyester, Polyamide, Phenolics)
Glass-Plastic Warhead (Epoxy, Polyester, Phenolic)
Plastic Control Surfaces (Phenolic, Polyamide, Epoxy w/ or w/o reinf. Glass-Asbestos-Metal)
Plastic Foam Insulation (Polyether, Isocyanate, Vinyl, Epoxy, Styrene)
Plastic Liner and Inhibitor (Epoxy, Polyamide, Polysulfide)
Plastic Protective Coatings (Alkyd, Epoxy, Silicone)
Plastic Motor Case (Epoxy, Polyester, Phenolic, Silicone)
Plastic Fuel-Binder (Epoxy, Polysulfide, Polyvinyl, Polyethylene, Synthetic Rubber, Polyester)
Plastic Bonded Metal Skin (Epoxy, Phenolic)
Plastic Igniter Cartridge (Phenolic, Vinyl, Cellulose)
Plastic Electro-Mechanical Components (Phenolic, Polyamide)
Plastic Throat (Phenolic-Asbestos)
Plastic Liner (Polysulfide)
Plastic APU Turbine (Phenolic-Asbestos)
Ceramic Coated Nozzle (Rokide, etc.)
Plastic-Bonded Metal Honeycomb (Epoxy, Phenolic, Silicone)
Plastic Coated Ignition Wires (Vinyl, Epoxy, Silicone, Urethane)
Plastic Booster Cases (Frangible)

Fig. 1—Plastics components for a typical multistage solid-propellant missile of the near future.

Table I: Workhorse Metals

Metal	Melting Point (°C)	Boiling Point (°C)	Specific Gravity	Use
Aluminum	670	2057	2.7	Standard lightweight alloys
Chromium	1615	2200	7.1	Plating, stainless steel, high strength and corrosion resistance at high temps.
Cobalt	1495	3000	8.9	High-strength, hi-temp. alloys, supermagnets
Copper	1083	2300	8.9	Electrical conductor, alloys
Gold	1063	2600	19.3	Alloys, plating, solders
Iron	1535	3000	7.8	Steel, metal standard
Lead	327	1620	11.5	Solders, radiation shields
Magnesium	651	1110	1.7	Low-weight metals and alloys
Manganese	1260	1900	7.2	Alloy steels, Al, Cu
Nickel	1455	2900	8.9	Stainless steels, corrosion-resistant alloys (Monel, Inconel, etc.)
Silicon	1420	2600	2.4	Rectifiers, solar battery, iron alloys, silicones
Silver	960	1950	10.5	Brazing alloys
Tin	232	2260	7.3	Plating, solder
Zinc	420	907	7.1	Alloys, plating

rocket missile could only be justified if it could be made from the remnants of other weapons. Gradually, however, there evolved specific metals and fabrication techniques (many of them borrowed from the aircraft industry) which apparently reached their zenith during the critical shortages of World War II and the Korean conflict. Much to the chagrin of postwar missilemen, who had finally mastered the available materials, metals did not revert to the old standards. New propulsion systems, higher temperatures, higher flight speeds and newer materials again made the metal masters hop.

Aluminum, and to some extent the magnesium alloys, have gained somewhat in overall structural application, but the trend toward higher operating temperatures and high-Mach-number flight regimes has forced the swing back again to the steels.

Specifically, the stainless steels are now in the spotlight. Table I lists some of the workhorse metal elements. Steel is still our number one metal. However, the more exotic missile metals (Table II) are beginning to take shape and will find increased application, particularly in the nuclear field.

Here is a review of the metals scene as reflected over the past year:

Aluminum. High-Mach-number flight has dulled aluminum structural applications but newer alloys are coming up. According to Alcoa, the U.S. will consume three million tons of this metal by 1958. Typical of the new alloys is 5086, introduced by Kaiser Aluminum & Chemical (4% Mg, 0.45% Mn, 0.1% Cu), which is not affected by welding and whose tensile is 38,000-47,000 psi. North American Aviation's cast aluminum alloy, called Tens-50, which is slated for missile use, is being poured by Rayson Foundry in Los Angeles.

Beryllium. NACA Ames Aeronautical Laboratory believes that this metal has promise for ballistic-missile nose cones. It finds beryllium six times better than copper on thermal and weight bases. Beryllium is considerably better than graphite but has problems with brittleness and difficult fabrication techniques for large sections.

Chromium. This is still a vital component of most modern stainless steels.

Cobalt. Metal is commonly used in high-temperature superalloys.

Copper. Copper alloys such as bronze are getting a new, close look for missile applications. Ampco Metals of Milwaukee has introduced Superstan 40, an aluminum bronze, iron-manganese superbronze. Castings give tensiles of 98,000 psi while the wrought metal is 135,000 psi.

Hafnium. Hopes are that the reactor grade will drop from the present \$50/lb. to \$20/lb. AEC, Bureau of Mines and Westinghouse are optimistic about hafnium in reactor controls.

Iron. In the form of steel, iron is still the backbone of the entire metals industry. However, pure crystals of iron show exceptional properties. Westinghouse Research Labs has measured tensile strengths of 500,000 psi for thin hairs of pure iron.

In 1957, actual production of steel in the U.S. was 120 million tons; capacity, 133 million tons. Presently 15 million tons of added capacity are under construction. The quality of steel has never been higher. Ore reduction is underway with United States Steel and Bethlehem experimenting with a direct iron ore reduction process. Stainless steel is the iron leader, with \$75 million going into aircraft and missiles in 1956, by 1960 up to \$200 million per year. Currently, stainless steel runs about \$2/lb. in common fabrications.

A new steel for Mach-4 flight—PH 15-7 MO by Armco Steel—will take temperatures of 1000°F. Ultimate strength at 1000°F is 129,000 psi. Composition is 15% chromium, 7% nickel, and 2.5% molybdenum.

Lithium. Present lithium cost is about \$10/lb. Newest alloy is X2020, an Alcoa lithium-aluminum metal. It has high strength up to 400°F and is 3% lighter than conventional aluminum aircraft alloys. This Li-Al alloy could raise the flight cruise level from Mach 2 to 2.5.

Magnesium. Of the 61,000 tons of primary magnesium produced in the United States in 1955, 36,000 tons were used in structural applications. Alloyed with aluminum, it gives corrosion-resistant and heat-treatable metals. It is used in canning uranium fuel elements and is most vital in the production of titanium. Ten thousand tons of magnesium were used in titanium reduction processes in 1955.

The B-58 uses a magnesium-thorium alloy 33% lighter than aluminum that has good rigidity and is heat-resistant. Hot forming has aided sheet bending but machining is still a problem with this slightly radioactive alloy. Dow Chemical is now extruding large-diameter magnesium missile fuselages for the Air Force at Madison, Ill. In addition, Dow's presses can make 20-inch widths, 24-inch OD tubing and large "I" beams. Dow has also introduced its HM21XA-T8 magnesium sheet. Containing 1.5-2.5% thorium and 0.35-0.80% manganese, the magnesium alloy has a tensile strength of 20,000 psi at 600°F.

Brooks and Perkins of Detroit have delivered magnesium spheres for the *Vanguard* satellite project.

Manganese. Now going into stainless steel, this element is usually alloyed with small amounts of nickel. Types 201 and 202 manganese steel are comparable in properties to the standard 18-8 stainless.

Molybdenum. "Moly" is finding increased missile applications. The Naval Ordnance Laboratory (Silver Spring, Md.) has developed "Thermenol," a nonstrategic moly steel. It contains 3-4% Mo and 15-16% Al and has better strength over 450°F than RC 130A titanium alloy. "Thermenol" is 17% lighter than 17-7PH stainless and can be used for compressor blades, heating elements, and missile skins.

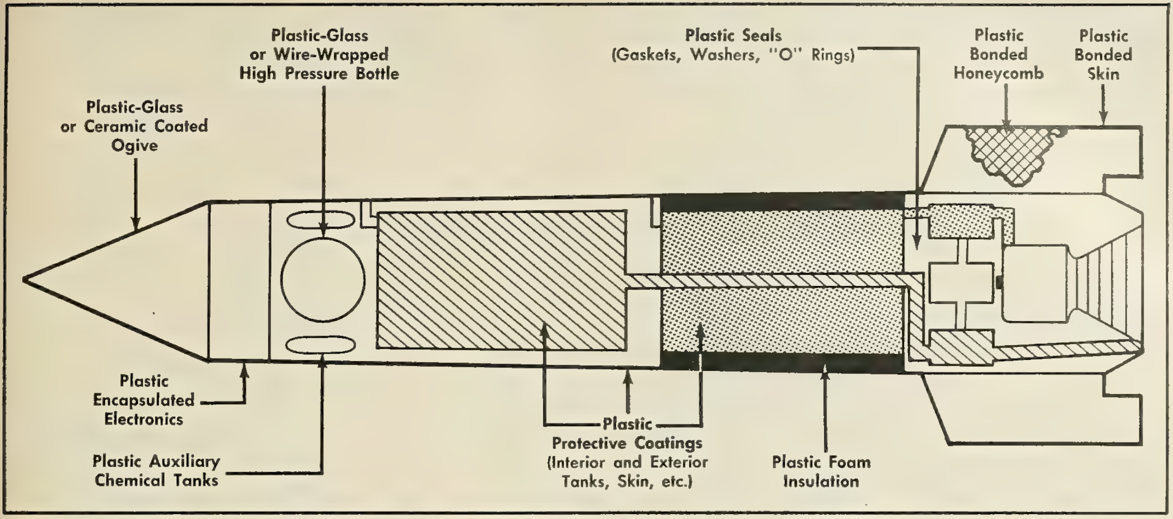

Plastic-Glass or Wire-Wrapped High Pressure Bottle
Plastic Seals (Gaskets, Washers, "O" Rings)
Plastic Bonded Honeycomb
Plastic Bonded Skin
Plastic-Glass or Ceramic Coated Ogive
Plastic Encapsulated Electronics
Plastic Auxiliary Chemical Tanks
Plastic Protective Coatings (Interior and Exterior Tanks, Skin, etc.)
Plastic Foam Insulation

Fig. 2—Plastics components for a typical large liquid-fueled rocket. Some specialized missiles may be 85 per cent plastic in a few years.

Climax Molybdenum has come up with a 99.5% Mo, 0.5% Ti alloy which has high strength above 1600°F. (Tensile is 132,000 psi at room temperature and 88,300 at 1600°F.) The metal has also shown considerable promise as a slipper for rocket sleds and its performance may be related to the formation of molten molybdenum oxide, which has a low coefficient of friction.

Climax has been working for some time on a contract with WADC to develop oxidation-resistant coatings for moly. Several coatings (aluminum-chromium-silicon up to 2600°F, nickel base up to 2200°F) have proven satisfactory, but no coating has been developed which combines ballistic and thermal impact with good erosion- and oxidation-resistance.

Nickel. U.S. consumption of this high-temperature alloying ingredient was about 300 million pounds in 1957; by 1960 it will be 450 million pounds. It is widely used in turbine blade alloys and in stainless steel for missile skins. Haynes Stellite Co. (Kokomo, Ind.) developed a high nickel alloy (with chromium, moly, silicon, manganese, titanium and aluminum) which has a tensile of 90,000 psi at 1500°F and 22,000 psi at 1800°F. Meanwhile, International Nickel Co. predicts a nickel steel (possibly with vanadium, moly, silicon, titanium and carbon) with a tensile strength of 300,000 psi.

Niobium. Also known as columbium, this missile metal is a fast mover and many firms are scrambling to produce the element which might permit engine-temperature operating increases on the order of 500°-1000°F. Its immediate use would be for turbines, where it might make 2000°F operation possible. (Present level is about 1650°F.)

Use in nuclear reactors as well as rocket engines is seen. For example, the USSR already is said to be applying niobium for rocket engines. Kennecott Copper Co. is one producer of niobium ore with zirconium and hafnium as byproducts.

Westinghouse Research Labs is using a zone refining process to produce pure niobium. DuPont and Thompson Products are teaming up to develop fabrication techniques for high-strength niobium alloys. Also in the niobium race are the Bureau of Mines (now studying niobium separation methods) and a host of producers in various

Table II: Missile-age Metals

Metal	Melting Point (°C)	Boiling Point (°C)	Specific Gravity	Use
Beryllium	1350	1500	1.8	Cu and Al alloys, neutron moderator
Boron	2300		3.3	Hardening steels, boron carbide, delay action fuzes
Cesium	29	670	1.9	Ion rockets
Gallium	30	1600	5.9	Heat transfer for atomic rockets
Germanium	958	2700	5.4	Rectifiers and transistors
Hafnium	1700	3200	13.3	Nuclear reactors
Indium	155	2000	7.3	Seals, alloys, solders, neutron indicators for atomic rockets
Iridium	2350	4800	22.4	Electrical contacts, electrodes
Lithium	186	1220	0.5	Li-6 for H-bomb, heat transfer, alloys
Molybdenum	2620	3700	10.2	High-temp. metals and alloys
Niobium	2500	3300	8.4	High-temp. alloys
Osmium	2700	5300	22.5	Hardener for platinum
Palladium	1553	2200	12.6	Contacts, spark plugs
Platinum	1773	4300	21.4	Thermocouples, contacts, electrodes
Rhenium	3000		20.5	Thermocouples, contacts, electrodes, corrosion-resistant alloys
Rhodium	1985	2500	12.5	Thermocouples
Ruthenium	2450	2700	12.2	Contacts
Tantalum	2996	4100	16.6	Resistors, high-temp. alloys
Thorium	1845	3000	11.3	Nuclear fuel, alloys
Titanium	1800	3000	4.5	Alloys
Tungsten	3370	5900	19.3	Tool steels, filaments, high-temp. alloys
Uranium	1150		18.7	Nuclear fuel
Vanadium	1710	3000	5.96	Alloys
Zirconium	1900	2900	6.4	Corrosion-resistant alloys, low neutron absorber

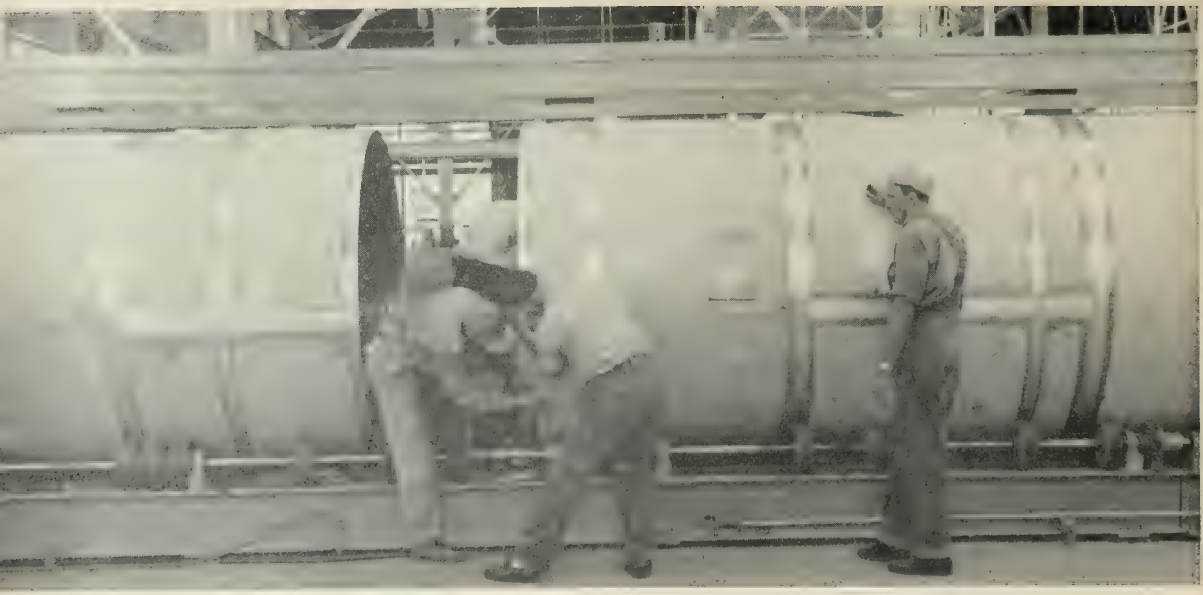


Fig. 3—Workmen welding sections of the JUPITER-C. New techniques have contributed many diverse uses of both old and new metals.

stages of production readiness (Kawecki, Electro Metallurgical, Horizons Titanium and National Research). Kawecki and Fansteel are said to be in actual production. Fansteel is supplying niobium to AEC, as is Shieldalloy.

Kennametal has supplied 7500 pounds of niobium to AEC; a like amount was delivered by the Wah Chang Corp. Biggest niobium aggregate shaping up will be the team-up of National Distillers & Chemical, Mallory & Co., and Sharon Steel Corp. to develop and manufacture niobium as well as titanium, zirconium, hafnium, and tantalum.

Rhodium. Sel-Rex Precious Metals of Belleville, N.J., has a new rhodium electroplating process which eliminates cracking and peeling. The Albany Plating Co. of Chicago uses rhodium for durable plates over brass.

Table III: Comparison of Metals and Plastics

Material	Density (lb./in.^{3})	Strength (psi)	Strength/Density Ratio
Mild steel	0.283	65,000	230,000
Aluminum (75ST)	0.10	85,000	850,000
Titanium alloy	0.16	90,000	560,000
Heat-treated steel alloy	0.283	180,000	635,000
Strongest steel alloy	0.283	225,000	795,000
Present glass-plastic	0.06	55,000	915,000
Future glass-plastic	0.065	75,000	1,150,000

Table IV: Thermosetting Plastics for Missiles

Resin	Estimated U.S. 1957 Production (million lb.)	Missile Uses
Alkyd	490	Coatings
Epoxy	36	Coatings, laminates, bonding, tooling, potting
Phenolic	580	Coatings, laminates, bonding, shell molding, tooling
Polyester	100	Laminates, radomes, potting, tooling
Silicone		Laminates, seals
Urea & melamine	340	Parts & moldings

Thermoplastic resin uses include films (cellulosics), windows (acrylics), mechanical parts (nylon), fixtures (high-impact styrene), paints & seals (vinyl), foams (urethanes), piping (polyethylene), seals (Teflon), etc.

Silicon. In addition to silicon going into steels and silicones, the purer forms have valuable nonstructural applications. Westinghouse Electric Co. is producing superpure silicon for resistors. The Raytheon Mfg. Co. produces silicon for infrared detectors. DuPont's facilities in North Carolina last year produced 50,000 pounds of semiconductor-grade silicon and 20,000 pounds of solar-battery grade.

Bell Telephone Labs has produced high-purity silicon by zone refining. This process uses commercial silicon at half the cost of the purer semiconductor grade. Bell uses the silicon for rectifiers and transistors.

Thorium. Used in nuclear reactors and for fuel elements, thorium is now produced at a 1,000-ton/year rate. AEC sells reactor-grade thorium for $20/lb. Metal Hydrides has produced pure thorium in a new iodide crystal process and forecasts a tonnage cost of $10-15/lb.

Titanium. Though its cost is still high in fabricators' hands (about $20/lb.), its high-temperature characteristics and lower density are making it standard for many missile applications. Titanium sponge is now at the $2.25/lb. level and hopes are to bring it to under $2/lb. soon.

Two new plating processes have been evolved which show considerable promise for missile hardware. The Missouri School of Mines, working under WADC contract, has a process for plating titanium on low carbon steel. The National Bureau of Standards and Springfield Armory have chrome-plated titanium to give an oxidation-resistant, nongalling bearing surface.

Zirconium. Sponge production in 1957 was about 2.7 million pounds; by 1958, will be 5.7 million pounds. A partial list of 1958 producers includes United States Industrial Chemicals (2 million pounds), Columbia-National (0.8 million pounds) and Carborundum Chemicals (1.5 million pounds). USI has made available a non hygroscopic and nonpyrophoric zirconium in plate form, hafnium-free, in diameters up to one inch.

Plastics Push

Some twenty years ago plastics emerged big-scale on the materials scene. They have grown to a 4.5-billion-pound production item in the U.S. during 1957. By 1960, U.S. production will jump to 5.7 billion pounds per year. Yet plastics have had a difficult time breaking into the missile market. During World War II, the most that plastics contributed to rockets were igniter cases that vaporized in a few milliseconds.

Then reinforced thermosets came along. But how could a plastic be used at rocket temperatures when it "fell apart" at one-tenth that temperature? The early Chinese powder rockets gave us a clue. Black powder was burned at 5000°F in ordinary paper tubes. Some paper burned away, but the charring produced carbon, which prevented fast burning. This opened the door to plastic motors, nose cones, radomes, fins and fuselages. The key was the lower thermal conductivity of the plastic, coupled with charring or burning in parallel layers.

Thompson Fiberglass Co. of Los Angeles reports the following achievements for plastics in rockets:

a. Nose cones that can withstand 750°F for 30 minutes.
b. Fin units on high-Mach-number boosters that handle 2400°F for one minute.
c. Phenolic laminate rocket-motor guide vanes that withstand 4500°F for two minutes.

Also, Raybestos-Manhattan has developed an asbestos-phenolic turbine wheel which operates by direct impingement of solid-propellant exhaust gases (2000°F) for 45 seconds and meets spin tests at 100,000 rpm.

Table III compares plastics with metals, while Table IV lists some of the plastics now being used for missiles. Fig. 1 shows plastics components for a typical multistaged solid-propellant missile of the near future. In Fig. 2 we see that plastics are also making definite inroads on large liquid rockets. Some specialized missiles may be 85% plastic within a few years.

The "big four" in high-temperature plastic applications include:

a. Epoxy for 500°F and short time to 3000°F (4000° to 4500°F with phenolic).
b. Polyester to 400°F, with short time exposure to 3000°F.
c. Phenolic to 500°F, with short durations to 4500°F.
d. Silicone, 500°-700°F and short time to 5000°F.

Typical reinforcing materials used with these plastics are glass fibers ("Fiberglas") and asbestos and quartz fibers. Metal reinforcements have also been used.

The Materials Committee of the Defense Department is looking for the following improvements in plastics for missiles:

a. Reinforced plastics with greater rigidity and hot strength.
b. Cheaper fabrication costs.
c. More uniformity in properties.
d. Better design for reinforced plastics structures.
e. Introduction of more machine methods for high production rates.

Plastics are still expensive (steel $0.10/lb.; aluminum, $0.25/lb.; plastics $0.50-1.00/lb.), but costs can be expected to come down with higher production rates. However, in high-cost items such as missiles, properties are expected to play a dominant role. For example, a current supersonic missile fuselage is being laid out entirely with plastic and will weigh only half as much as a comparable metal unit. Glass-reinforced plastic missile radomes have already proven superior to just about all other materials up to 400°-500°F.

Some of the roles that plastics

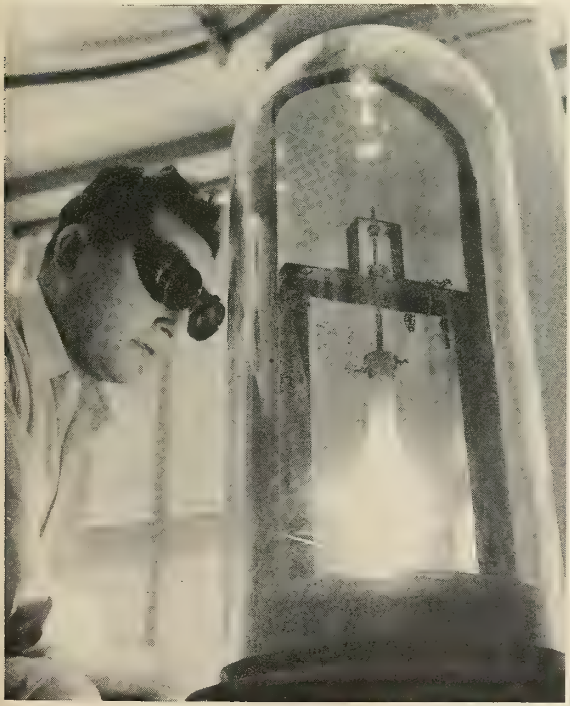


Fig. 4—Testing tensile strength of metals and ceramics.

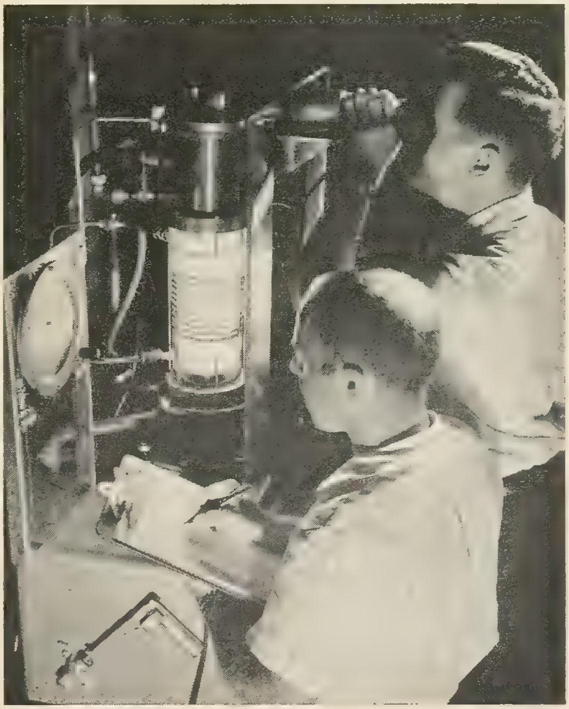


Fig. 5—Purifying niobium by the "cage zone melting" process.

already are playing are outlined below:

Aerojet-General Corp. The warhead on the *Nike-Hercules* will be glass-plastic, produced under a $1.8-million contract.

Bureau of Ships. This U.S. Navy group has put out the call for plastic dielectrics and potting compounds that can take 250°C. Soon it will need materials to sustain 500 hours at 350°C and later 3,000 hours at 500°C.

Carpenter Steel Co., Union, N.J. is turning to the production of chemical polyethylene pipe in one-half to four-inch-diameter sizes. Its PR-150 can take 150 psi at 75°F. The United States produced 55 million pounds of plastic pipe in 1956.

Continental-Diamond Fibre, Newark, Del., has plastic nose cones which can take sustained temperatures of 400°F, and also glass-base, metal-clad laminates of Teflon and epoxy for printed circuits.

Corwin Polymer Products, New Haven, Conn., is developing heat-resistant urethane foams in the 500°-600°F range. These foams can now withstand up to 400°F with only 2% volume change.

Dow Chemical Co. Silicone-glass laminates now used on the B-58 are being considered for *Jupiter* nose cones made of seven to ten layers. Tests show that four to five layers burn but the remainder maintain structural integrity.

Mic-Lin Co., Maple Shade, N.J. A Teflon plastic hose encased by a stainless steel braid can take 4000 psi at 500°F. It is flexible down to −100°F and comes in diameters of 3/16 to 1 1/8 inch.

M. W. Kellogg Co., in cooperation with BuOrd and Allegany Ballistics Lab, has developed entire motors (case, nozzle, heads) for solid-propellant RATO and booster rockets.

NACA and Forest Products Lab have done considerable work with metal-bonding plastics. They find epoxies give good strengths to 250°-300°F. Phenolic-cured epoxies have good resistance to thermal softening to 600°F and good resistance to thermal degradation for 200 hours at 550°F. Glass-cloth-plastic honeycomb cores have proven out at 500°-700°F.

Naugatuck Chemical. Polyesters with 10-25% maleimide result in glass fiber laminates with flex strengths of 36,000 psi while maintained at 500°F for one week.

Pastushin Aviation Corp. produces centrifuge-spun moldings of glass-plastics for radomes, missile containers and drop tanks. Present techniques permit production of sections 10 feet long of four-and-one-half-foot diameter. Wall thickness, up to one-half inch, can be controlled to ± 10% thickness. Typical properties of spun parts are tensile, 17,200 psi; flex, 30,700; specific gravity, 1.77. Twelve parts per week can be produced. Tooling leadtime is 45 days.

Raybestos-Manhattan. A six-and-one-half-foot-long (30-inch-diameter base) nose cone of asbestos-plastic that can stand temperatures of 1000°F is being produced for the *Vanguard* vehicle. Other plastic parts for *Titan, Tartar, Terrier, Sidewinder* and *Polaris* are in work.

Shell Chemical Corp. Its Epon 422 tape (epoxy-phenolic) is used to bond metal to core on B-58 panels and has operating temperature ranges of −70° to 500°F.

St. Louis University. Borazine (boron-nitrogen polymers) point to newer high-temperature plastics.

University of Tokyo. Prof. Hideo Itakawa reports the successful firing of

Table VI: High-temperature Coatings

Name	Company	Temp. Limit (°F)	Coating	Base	Uses
Flame Alumina A	Armour Research Foundation (Chicago, Ill.)	3650	99% Al_2O_3		Rocket nozzles, storage tanks
Flame Alumina D		3650	97% Al_2O_3		Pump housings
Flame Ceramic IA		2500	Fe-Al-Ti	Al	
Flame Zirconia		4750	98% zirconia	Carbon	High-temp. impact
Flame Ceramics	Continental Coating Corp. (Chicago, Ill.)	3500	98.6% Al_2O_3 98% zirconia	Mg, Al, Steel	Rocket nozzles, combustion chambers, ducts, burners
		4500	TiO_2		
		3270	Cermets		
Flame Plating	Linde Air Prod. (NY., N.Y.)	1800	99% Al_2O_3	Steel, Al, Ti	Turbine seals
			92% WC, 8% Co	Mg, Mo, Cu	
Flame-rock Ceramics	Montzine Corp. (Chicago, Ill.)	3500	97% Al_2O_3		
Metallizing	Metalweld, Inc. (Philadelphia, Pa.)	1800	Nichrome	Iron, steel	Heat corrosion w/o S
			Nichrome + Al		Heat corrosion w/S
Rokide A	Norton Co. (Worcester, Mass.)	3600	98.6% Al_2O_3	Iron, steel, nickel alloys, copper, alum., Mo, C, Mg, Ti, etc.	Rocket nozzles, chamber liners, tailpipes, etc.
Rokide Z		4500	98% Zirconia		
Rokide ZS		3000	65% Zirconia 34% Silica		
Sprayweld	Wall Colmony Corp. (Detroit, Mich.)	1900-2225	A-B-Ni	Low alloy & mild steel; heat-treated stainless	Bearings
Thermospray	Metallizing Eng. Co. (Westburg, N.Y.)	3700	Al_2O_3	Metals & plastics	
		4600	Zirconia		
	Ryan Aero Co. (San Diego, Calif.)	3500	Ni-MgO	Stainless Steel, Inconel	Afterburners, combustion chambers

a plastic-glass solid-propellant rocket motor. Later rockets will be fired from balloons in IGY tests.

Ceramics Click

Age-old ceramics were known to have proper temperature-resisting properties needed for rockets. Rocketeers, realizing the shortcomings of metals and plastics, turned to the nonmetals (Table V) and found a wealth of high-temperature materials. However, most ceramics lacked the strength and the thermal shock-resisting characteristics of metals. Various techniques, however, were evolved for metal coatings (Table VI). Marriage of metals and ceramics has begun and large-scale rocket applications may not be far off. For example, NACA has mixed aluminum oxide in nickel to obtain good strength without extreme brittleness. The University of California and NACA have studied ductile ceramics such as magnesium oxide. Russia, too, is studying "alloys" of lattices of ceramics and metals and doing much basic research in flexible ceramics.

Some highlights of ceramic missile development include:

Air Force Cambridge Research Center points to silicon carbide transistors operating at 1400°C and frequencies of over 100 mc. Westinghouse and Armour Research are working on this project.

Buffalo Forge has developed ceramic filters in the 1500°-2300°F range which possibly could go up to 3000°F. Good shock resistance and pressures to 225 psi have been successful in submicron particle removal.

Climax Molybdenum Co. has developed a molybdenum disilicide coating for graphite rocket nozzles which gives protection against high-velocity oxidation up to 3500°F. The moly compound is mixed with a phenolic resin, applied to graphite, and heated to 4000°F, leaving a glazed coating.

Fairchild Camera & Instrument Co. has vacuum-evaporated ceramic films for coating camera potentiometers rated at 225°C, with special ones operating at 400°C.

General Electric Co. Borazon is GE's diamond substitute. Boron nitride made in a press at one million psi pressure and a temperature of 3000°F, the material is as hard as natural diamonds and will find use in industrial cutting tools. Borazon, unlike natural diamonds, has good high-temperature oxidation resistance.

Gladding, McBear & Co. Ceramics for radomes can now be produced at tolerances of ±0.001 inch. Aluminum oxide is sprayed on a chrome-plated mandrel, subjected to 30,000 psi and fired at 2200°F. Finally it is machined on a lathe with diamond tools, and then given a finish firing at over 3000°F.

Table V: High-temperature Nonmetals

Material	Density (g/cm³)	Melting Point (°C)
Hafnium carbide	—	4160
Tantalum carbide	—	4150
*Carbon	1.8-3.5	3500
Tantalum nitride	—	3360
Titanium nitride	—	3220
*Titanium carbide	4.3	3140
*Zirconium oxide	5.7	2900
Tungsten boride	—	2880
*Tungsten carbide	16.0	2820
Hafnium oxide	9.7	2812
Vanadium carbide	5.4	2810
*Thorium oxide	9.7	2800
Thorium carbide	8.9	2773
*Boron nitride	2.2	2730
*Silicon carbide	3.2	2700
*Beryllium oxide	3.0	2570
Molybdenum carbide	8.4	2570
*Magnesium oxide	3.7	2540
*Aluminum carbide	—	2200
*Aluminum oxide	4.0	2050

*Now being used or considered for use as a high-temperature material.

Gulton Industries, Metuchen, N. J. Aluminum (24-S and 75-S) can be up-graded to operating temperatures of 1000°F by a new ceramic coating of lithium borosilicate, lithium chromate, and lithium fluoride.

Kraus Research Lab., Cockeysville, Md. Porcelax is an aluminum silicate coating that is baked on at 350°-400°F. It is more resistant to mechanical shock than porcelain and can withstand 1000°F.

Linde Air Products Co. Synthetic sapphires up to three inches in diameter will prove valuable for IR transmitter applications and other infrared missile uses.

Servomechanisms, Inc. Potentiometers and capacitors are vacuum-deposited with ceramics such as aluminum oxide, making them good for 500°C temperatures.

Radiation Shielding

Already of growing importance in reactors, radioisotope handling and irradiation processes, radiation shielding materials for manned aircraft and rockets are receiving considerable attention. Two of the most effective shielding techniques employ distance and mass. Since distance is impractical in flight installations, the search has been for more effective shielding materials, particularly from neutrons and gamma rays.

Hydrogen is one of the best attenuators and captors of neutrons. Boron, lithium, silver, gold, mercury, iridium, and cadmium, among others, are all excellent neutron captors. Unfortunately, only the heavy elements such as uranium, thorium, lead, gold, tungsten, or tantalum have proven good gamma attenuators.

During the past year, three radiation shielding materials have been introduced:

Boral. Alcoa has dispersed boron carbide in aluminum-clad sheets. Neutron shielding power equivalent to 25 inches of concrete is provided by ¼-inch-thick sheets. The material will not stop gamma rays.

Boron stainless steel. Superior Steel Co., Carnegie, Pa. has developed this alloy (18% Cr, 10% Ni, 1% B), with tensile strength of 90,000 psi, which is 15 times more effective in stopping neutrons than ordinary stainless steel. It has been suggested that substitution of boron-10 might increase the neutron-stopping power. Again, this alloy is not a gamma-ray shield.

Leadolene. Produced by Telectro Industries Corp., Long Island, N.Y., this gamma shield consists of 95% lead dispersed in 5% polyethylene. Recent experiments with epoxy resins under gamma radiation up to 10^8 roentgens indicate that there is little change in heat distortion and compressive properties. Highly hydrogenated plastics may provide a breakthrough for lightweight gamma shielding.

Lubes

Present lubricants must operate over a temperature range of —65° to 165°F. According to the Wright Air Development Center, the operating temperature will soon be up to 500°F —a temperature at which conventional hydrocarbon lubricants and hydraulic fluids break down and cause a multitude of operational troubles. And, says WADC, in 5 years we will need lubes operating at 1000°F.

Organics are now getting temperature stability from compounds of boron, phosphorous, fluorine and silicon. Here are some of the materials being investigated for high-temperature lubes:

American Potash & Chemical: phosphinoborine (phosphorous-boron compounds).

Ethyl Corp.: stannoliloxane (tin-silicon).

General Electric: "Versilubes" (silicones) for use above 450°F (575°-700°F); being studied for use on chemical bomber WS-110A.

WADC: tetra substituted alkylsilanes (now in the advance testing stage as a hydraulic fluid); fluoroalkylsilanes; ferrocene.

Beyond these, liquid metals are being suggested as ultratemperature lubes and hydraulic fluids.★

Market Analysis for the Missile Industry

an analytic approach to planning

by **Douglas S. Evered**

FOR EACH of the past six years United States defense expenditures have been between 35 and 43 billion dollars. This has made the Federal Government the largest single customer available to U.S. industry. During 1957 an economy-minded Congress and seemingly earnest disarmament talks made the future of this annual expenditure seem uncertain. Cutbacks, stretch-outs and layoffs became common as belts were tightened. The advent of the *Sputniks* and Soviet ICBM threats did much to dispell the belief that sudden death from precipitous disarmament was in store for defense industries. However, their presence did little to halt one trend in defense procurement—the shrinking market for military aircraft that has accompanied the swing towards missiles.

Competition in the Missile Industry

Automobile Companies	
Ford	Aeronutronic Systems—parent company allocated $10,000,000 for *Far Side* project
Chrysler	Production contract for *Redstone* and *Jupiter* missiles for U.S. Army
General Motors	Powerplant production for Martin *Matador* and Chance Vought *Regulus* missiles—AC Division—guidance equipment for *Thor* IRBM, *Matador* and *Regulus*
Studebaker-Packard Corp.	Aerophysics Development—*Dart* missile for U.S. Army—high-altitude sounding rockets
Rubber Companies	
Firestone	Prime contractor for *Corporal* missile for U.S. Army—missile development by J.P.L.
General Tire	Aerojet-General Corp.—rocket engines for Martin *Titan*—high-altitude research rockets
Goodyear	Goodyear Aircraft Co.—Akron—guidance for Martin *Matador* missile
Unclassified Competitors	
Kaiser Industries	Contracts for guidance systems development at Toledo—contracts for missile electronics at Richmond, Va.
Bendix Aviation	*Talos* prime contractor for U.S. Navy. Also *Talos* L for USAF
Minneapolis-Honeywell	Inertial guidance systems
Thompson Products	40% control of Ramo-Wooldridge Corp. (responsible for Convair *Atlas* and Martin *Titan* ICBMs and *Thor* IRBM)
American Machine & Foundry	Ground support equipment
American Bosch	Arma Co.—guidance systems
Avco	ICBM nose cone research
General Electric	*Vanguard* first stage—production of rocket motors and ICBM nose cone
General Mills	Inertial guidance systems

Electronic Companies with Missile Contracts

Sperry
RCA
Motorola
Western Electric
Philco-Raytheon

Aircraft Companies with Missile Departments

Beech
Bell
Boeing
Chance Vought
Convair
Douglas
Fairchild
Hughes
Lockheed
Martin
Northrop
North American
Republic
Ryan

Recent events undoubtedly mean that more money will be forthcoming for defense. Much of the money Congress is being asked for will go into missiles but it will have to be spent in what has become a highly competitive market.

Over the last few years a steady stream of competitors has been attracted by the missile bonanza. What was formerly the exclusive domain of the aircraft manufacturer is now inhabited by automobile companies building complete missile systems, food companies developing guidance equipment and tire companies manufacturing rocket engines. The result is a healthy competitive situation in the missile business. Putting the Departments of the Army, Navy and Air Force into a buyer's market for missiles is unquestionably good for the country. It means more defense per dollar of the taxpayer's money. It also means that realistic companies have had to seek ways to strengthen their techniques for getting their share of new missile business.

Next to maintaining a first-rate scientific and engineering capability, a specialized form of market analysis is the most useful device for bolstering the business-getting capability of a missile manufacturer. By providing management with reliable predictions of future missile markets, it can play a significant role in coping with the competitive situation which has developed. Take for example that important question of company-financed studies of new system requirements. No missile company can afford to study them all, and missile market analysis can ensure that funds set aside for this purpose are spent most wisely.

Generally speaking, new missile projects must represent a substantial advance over existing systems or meet some new operational requirement before they are funded. To achieve such advances means being aware of technological development and incorporating the findings of research into new designs. Indeed, many missile manufacturers spend sizeable amounts of their own money on the basic research which brings about technological advances. This directed effort can be pointed by missile-market analysis.

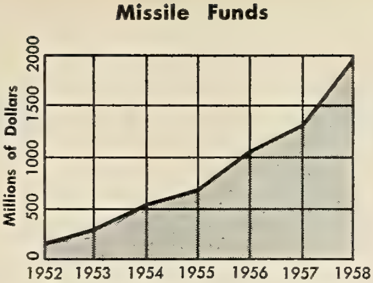
The diverse nature of the specialized activities which make up missile-market analysis explains why, in many missile companies, no formal market-analysis function is defined. Instead, the various studies made in a complete search for new business have their findings synthesized and used by departments with a wide variety of titles—Military Requirements Section, Long-Range Planning Section, Development Planning Section, Military Liaison Section, Military Contracts Section, Proposals Section, Customer Relations Section—to name some of the more familiar titles. In any one of these organizations, aspects of market analysis are likely to be going on in perhaps an unrecognized, or at least ill-defined, manner. Only where the possibilities of market analysis have been *recognized* and *defined* can the device function with the best results.

What then are the steps in effective market analysis for the missile business?

They begin with the close monitoring and evaluating of the technological developments being made by industry, universities and governmental scientific organizations such as the National Advisory Committee on Aeronautics. As already indicated, this step is often enhanced by basic research activity within the company. The application of technological development to future missile systems is the purpose of this type of analysis.

A second step consists of becoming aware of military planning through close association with those agencies which directly or indirectly determine future requirements. This is a liaison aspect of market analysis. Both in a formal and an informal manner, relationships must be established and strengthened with agencies such as ARDC, AMC, ABMA, TAC, SAC, ADC, WSEG, AFDAP, AFMLP, ONR, OSR, RAND and OEG.

The market analysis process also must include the study of pertinent economic factors. Federal fiscal policies, defense appropriations and the funding expectations of existing and planned systems must be projected and measured against the background of a general economic forecast. In this way the potential volume of future missile business and that share the company should expect to get can be determined.



Although the foreign political situation is cloudy much of the time, attention must be paid to this subject for the rather obvious reason that missile procurement is undoubtedly influenced by international tensions. Insincere smiles or bravado statements by Soviet leaders profoundly, though perhaps indirectly, affect the future of missile procurement. Insight into basic political motives and the immediate and eventual outcome of pursuing them must be obtained and injected into the analysis.

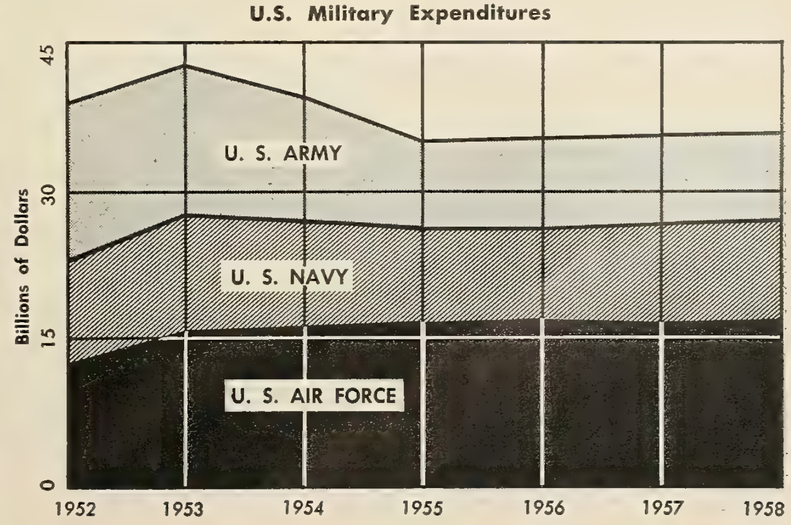
The desires, capabilities and limitations of the missile manufacturer to become associated with new projects must certainly be taken into account in market analysis for missile business, as must the equally important factor of the customer's view of the missile manufacturer's availability to take on new work.

Finally, the activities of competitors must be monitored to determine their effects on the likelihood of obtaining future contracts.

It must be obvious from this review of the ingredients of missile market analysis that a team approach has to be used. The team must include physical scientists to compile and evaluate technological developments, social scientists to investigate economic and political factors and military experts to interpret military planning. The team must be attached to the policy-making level of the company so that it will be both intimately aware of the basic philosophy of the enterprise and able to present its findings and recommendations to the policy-makers.

Equally obvious is the fact that not all companies will conduct missile market analysis in great depth. Some companies may lack the resources for basic research or may not see the wisdom of preparing themselves to take on advanced projects through obtaining a full understanding of the total missile market. Other companies attempt to achieve a sufficient degree of understanding by reliance on the work of their liaison staff. However, unless all of the influencing factors are taken into account, the results of missile market analysis are likely to be disappointing. When the additional usefulness of the market analysis team for exploring diversification opportunities is recognized and used, their presence in well-managed missile companies can readily be understood.

Comprehensive market analysis for the missile business begins with the collection of quantitative and qualitative data and proceeds through analysis and the application of seasoned value judgment to arrive at findings and recommendations for management. It is a process which does not displace the intuition which has largely shaped the growth of American competitive free enterprise.★



How Good Are Free Radicals?

laboratory device or new propulsion system?

by **Erik Bergaust**

RIGHT NOW, free radicals do not offer the hope of a practical, high-energy, high-density rocket propulsion system. They are becoming an important research tool in the laboratory but propulsion systems are a long way off. A big breakthrough has to be made in stabilization and, possibly, in production. Production techniques are just being discovered, while techniques for stabilizing these energetic chemical fragments are very few.

Rocket engineers have long looked to free radicals for performances of two to five times greater than conventional redox (reduction-oxidation) or combustion systems. However, laboratory preparative techniques have been slow in coming.

The famous German chemist, Justus von Liebig, offered the concept of the radical as a group of atoms that acted as a unit in a chemical reaction. Liebig and Wöhler worked on the benzoyl radical. (In 1828 Wöhler made the first lab synthesis of an organic compound.) In 1900, at the University of Michigan, Moses Gomberg prepared an organic free radical—triphenyl methyl—a giant fragment that can live for days. By 1929, Paneth and Hofeditz broke down tetramethyl lead into lead metal and free methyl radicals.

Free radicals are fragments of ordinary, stable chemical molecules (Fig. 1). These molecules can be "cracked" by applying energy—heat, electric discharges or radiation. Free radicals (unlike ions) are electrically neutral and are usually characterized by an odd number of electrons in the outer shell. Free hydrogen would have one electron, methyl nine, hydroxyl nine and chlorine 17.

Free oxygen, however, has two unpaired electrons—leading to extreme reactivity. The radical with an odd unpaired electron seeks a more stable level and also accounts for extreme

A. H_2 + Energy (92,910 Btu/lb) → 2H → H_2 + Energy (92,910 Btu/lb)
Breaking molecular hydrogen into free or atomic hydrogen required energy. This energy is released when the molecule is reformed. Without combustion this technique would allow tremendous concentration of energy for rockets.

B. H_2O (HOH) + Energy → H + OH (Hydroxyl)

C. CH_3OH + Energy → CH_3 (Methyl) + OH

D. O_2 + Energy → O + O

E. NH_3 + Energy → NH (imine) + H + H

Fig. 1—Examples of free radicals: A illustrates most energetic systems. Others are B, water; C, alcohol; D, oxygen; E, ammonia.

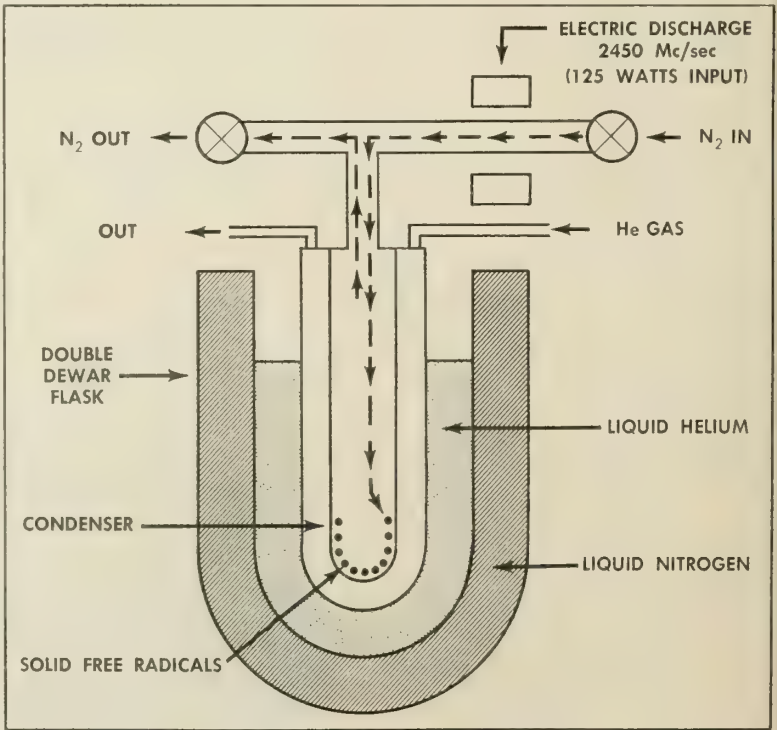


Fig. 2—NBS free radical technique. (Note: Liebig, advocate of the free radical, has also made the present lab prep possible. Condenser above is an adaption of the Liebig Condenser.)

reactivity. The energy residing in the free radical systems seeking the more stable parent molecule is very great (Table I) and is considerably greater than ordinary redox reactions.

Typical theoretical performances (based on recombination alone) are presented in Table II. After recombination into molecules, additional performance increases can be effected by the use of standard combustion techniques.

In 1948 at Catholic University, a free radical research technique, now standard, was accidentally discovered. There Francis Rice used heat to decompose hydrazoic acid (HN_3) into nitrogen and the imine (NH) radical. At liquid-nitrogen temperatures (77°K) or at approximately −320°F blue imine radicals were frozen out. Absolute zero (0°K) is −273°C (−459°F), or that temperature at which molecular motion ceases.

In 1954 Herbert Broida and John Pelham of the National Bureau of Standards sent an electric discharge through nitrogen gas and condensed out a solid at 4.2°K. Visible radiation from this solid has been interpreted as coming from atomic and molecular nitrogen. Fig. 2 shows the NBS Dewar collection system for free radicals.

The electric discharge breaks down the molecular nitrogen into atomic nitrogen. Free nitrogen is condensed as a solid at the bottom of the apparatus. With flow rates of 10 to 200cc/min, the solid glows green but turns yellow at the higher rates. Local warming causes brilliant blue flashes from the surface as the nitrogen goes back into its normal state and releases large amounts of energy. NBS has also prepared atomic oxygen and hydrogen.

From this early work, free-radical research projects have branched out to include the following:

National Bureau of Standards has underway a three-year program supported by the Department of Defense for the formation and stabilization of free radicals. The NBS project is unclassified and is a center for university and industry free-radical research. Several large firms have stationed scientists at NBS to aid research.

Table I:
System Energies

Fuel	System	Heat Content (Btu/lb)
Atomic hydrogen	Nonredox	92,910
Molecular hydrogen	Redox	52,000
Diborane	Redox	32,000
JP-4	Redox	18,000

Table II:
Free Radical Performances*

Radical (mol)	Diluent (mol)	Molecule	Specific Impulse (sec)
1 NH	2.8 H_2	NH_3	410
1 CH	5.0 H_2	CH_4	510
1 H	1.7 H_2	H_2	775
H	H	H_2	2160

*Nonredox systems

Table III:
Concentration Versus Performance*

Free Radical Concentration in Diluent (mol %)	Nonredox Specific Impulse (sec)		
	O in O_2	He* in He	H in H_2
5	60		200
10	100	300	400
20	140	360	580
40	190	500	800
60	225	625	950
80	250	730	1040
100	265	800	1210

*Frozen equilibrium as calculated by GE

Air Force Office of Scientific Research is sponsoring free-radical research.

Army Office of Ordnance Research is also sponsoring such research.

Applied Physics Laboratory is working on the stabilization of hydrogen atoms trapped in solid hydrogen at 4°K.

Aerojet-General Corp. has been working on a free-radical AFOSR project since 1954. The firm is aiming for production of ammonium azide via hydrazoic acid and the imine radical.

General Electric Co. Rocket Engine Section at Cincinnati has been calculating performance of free radicals for Army Ordnance.

Naval Radiological Defense Laboratory has undertaken irradiation of ethyl and methyl alcohol with high-intensity sources at liquid-nitrogen temperatures.

Office of Naval Research is also supporting free-radical research.

Other free-radical research work includes:

Atomic Energy Commission at Oak Ridge has irradiated frozen sulfuric acid with cobalt 60.

Caltech scientists are depositing molecules at 20°K and irradiating them to study possible new reactions.

Monsanto Chemical Co. has worked at NBS in blending gases to react with free radicals.

Olin Mathieson is studying the reaction of free radicals at NBS on various surfaces such as tungsten.

University of Lyon is working on the prism spectroscopy of free radicals at NBS.

Washington University suggests free radicals as an important energy step in the process of photosynthesis.

The USSR has been very active in the free-radical area. The Reds have reported production of atomic oxygen, nitrogen and hydrogen. Organic free radicals have been studied along with free-radical boron compounds.

The Soviets are especially interested in combining small amounts of free-radical fuels in conventional solvents, thus producing a two-step propulsion system. Considerable work has been evidenced in the OH and the HO_2

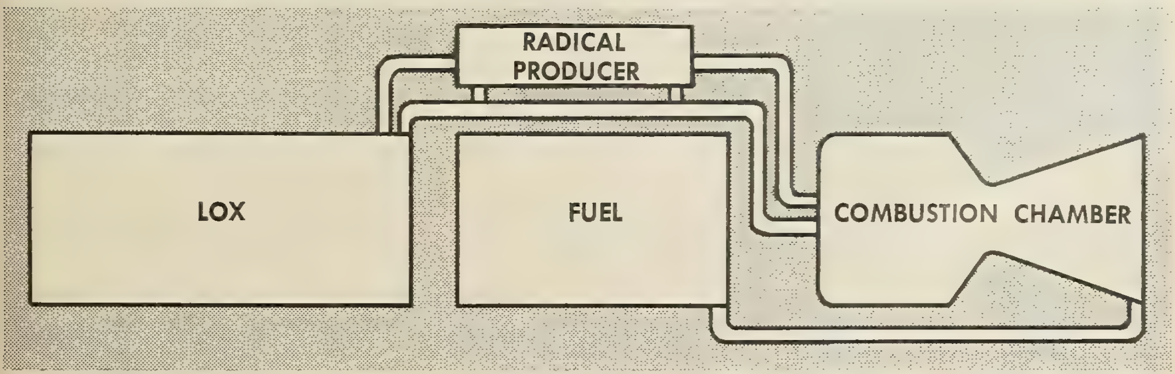


Fig. 3—Example of two-step propulsion system. Relatively small amounts of oxygen gas are fed into a jacketed free-radical producer. Atomic oxygen is fed into combustion chambers where conventional oxidant-fuel (redox) system is also operating. Such a system might offer immediate increases of about 50 seconds until more is learned about stabilizing high concentrations of free radicals.

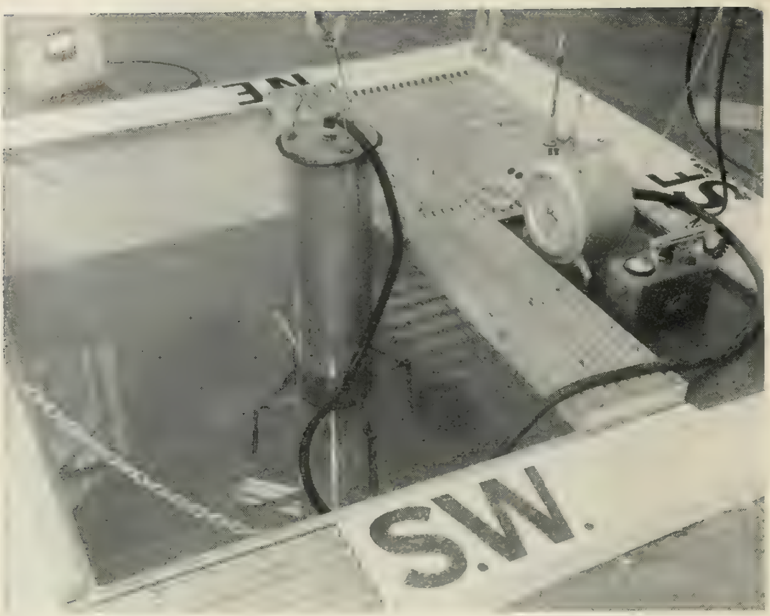


Fig. 4—Production of free radicals by gamma ray bombardment in a cobalt 60 source.

radical. Russian work with hydrogen superperoxide synthesis, possibly a polymer of the HO_2 radical, has been under way for several years. Several research teams in the free-radical scene have been in operation at least since 1950.

Almost all free-radical work employs cryogenics (ultralow temperatures) at low pressures. The theory is simple. At very low temperatures kinetic movement is very slow. If the pressure is kept down, the fragments do not bombard one another and hence lose energy.

This theory may make practical application difficult if not impossible. For example, a jump of a few degrees Kelvin for free radicals is like thousands of degrees for ordinary chemical systems. Warming a free radical from 4°K to 25°K is equivalent to a jump from room temperature to that of an acetylene flame. And performance drops with increasing radical size.

The large, stable fragments do not offer good performance as such (Table III). Hydrogen is better than helium or oxygen. However, after free radicals revert back to ordinary molecules and release energy, the recombined molecules are still available for further energy release via combustion reactions. Almost any conventional propellant system could be improved performance-wise by a free radical "spike" (Fig. 3).

In addition to the critical stability, concentration is also important. Present free-radical concentration estimates are about 0.1 per cent by electron spin resonance methods and up to one or 10 per cent by chemical or calorimetric methods. Thus, say, incorporation of about 1 per cent atomic oxygen in liquid oxygen might jack up rocket impulse by about 50 seconds.

Present lifetimes of free radicals leave much to be desired. At pressures of about 1 mm Hg, NBS figures a lifetime of about 15 seconds for free radicals. With decreasing temperature, the lifetime increases. GE figures that metastable neon has a half-life of about 25 seconds at 10°K, many years at 5°K.

Because of these facts and because of lack of sophistication in the field, Dr. Broida said recently that the odds do not now favor free radicals as practical, high-density, normal-temperature propellants. Perhaps this grim picture could change if better stabilization techniques were evolved. Such stabilization might result from new solvent systems, protective colloids, or occluded solids. It might even take the form of free radicals trapped in a solid propellant, as recently suggested by H. W. Ritchie of Thiokol. However, before we can use free radicals in a rocket we must learn much more about them. This takes years.★

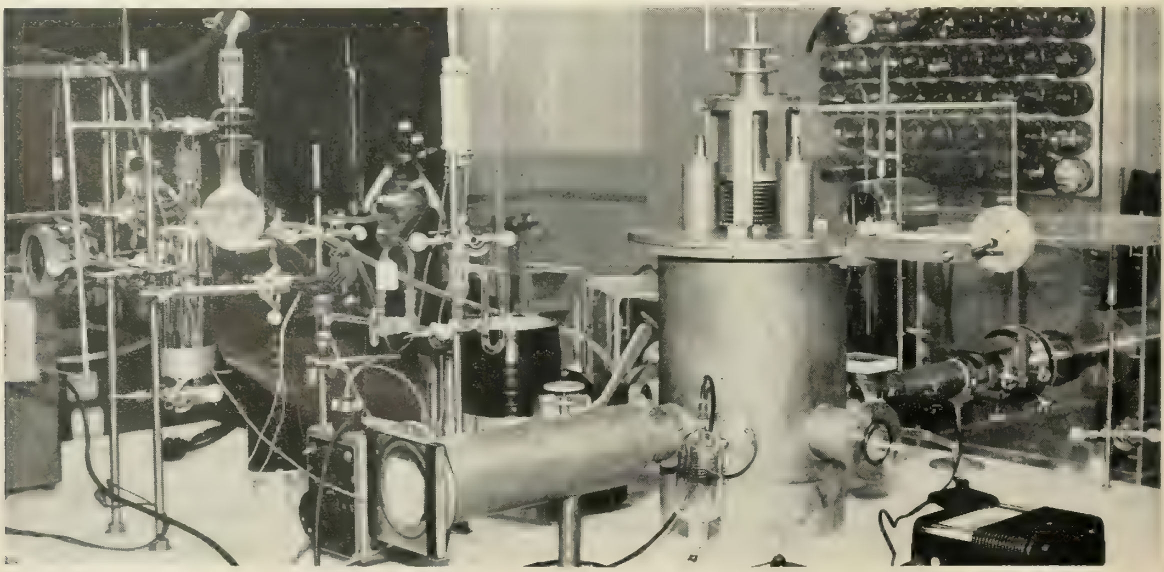


Fig. 5—Electron diffraction apparatus for studying and producing free radicals.

SELLING MISSILES

by Seabrook Hull

The scramble in the missile marketplace is getting louder and rougher. Everyone wants to get into the act. Some answers to "how to get in the missile business" involve some pretty extreme answers—even to the point of buying one's way in. However, one conclusion is general: the missile business is big already and getting bigger all the time. It's also a profitable one in more ways than one.

Some companies have been in the missile business from the beginning. Airframe-makers, for example, were some of the first, because it appeared at the time that they were a likely place from which to buy missiles. "After all, like airplanes, they fly too, don't they?" However, it was soon apparent that it wasn't all that simple, and others were brought in. Forging, machining, welding and heat-treating, for example, to a large extent took the place of casting, sheet-metalworking and riveting. Since then some of the "unlikeliest" kinds of companies have emerged playing a major role in the burgeoning industry. Now the pull of the swelling dollar sign is drawing them in by the hundreds. Competition gets tougher daily.

There are a few basic across-the-board rules for getting into the missile business. First, and most obviously, study the market. Find out what's wanted; who's already in the business; who is doing the subcontracting; who are the vendors; how much money is involved; and which agencies have it to spend.

Next, compare the requirements with your facilities, both human and capital. Have you the equipment for supplying any of the market's needs? These are elementary approaches to any business. They apply just as much to rockets and missiles as they do to anything else.

If you find your capabilities fit the market's needs, get out and sell. Sell! This again is just as vital in missiles as it is in, say, plastic combs, automobiles or ladies' underwear. And in selling, there's no real substitute for being on the spot in person.

If you're just starting out, you'll probably have better luck breaking into the business if you content yourself with first becoming a subcontractor or vendor. This means getting in touch with the purchasing officers and/or project managers of those companies with prime or large subcontracts. You can get a list of these from the Department of Defense.

In making this contact, remember that the man you're trying to sell is busy, may not be all that bright, talks to dozens of other people trying to sell precisely the same services or products that you offer. In other words, make your proposal clear, concise and to the point. Offer a specific product at a good price and with confident guarantees of top quality and on-time delivery. These points should be obvious, but the number of people who wander vaguely in with bland statements about "I've got so and so facilities. What can I do?" is appalling.

Now maybe, your capabilities don't exactly fit the missile market requirements. This doesn't necessarily mean you're out of luck. For example, most missile metals require a density not attainable in normal casting processes. But casting is a valuable mass-production technique. Thus, one possibility here—to start—is to get a research contract to determine (a) just where casting can and cannot be used and (b) develop more suitable casting methods.

In other words, if your processes seem in danger of being bypassed by the missile age, get the Government to pay you to find out how it can be kept in the industrial complex. However, be specific in your proposal and don't be too ambitious (greedy) on the first go-'round. Figure a program that will bring solid results quickly and inexpensively—and will provide a reason for a bigger, more costly program to follow.

Government contracts below, say, $25,000 can be approved by a division chief. As the sums get higher, the redtape they encounter mounts rapidly. It may not be much money, but it's a toe in the door and often a very good way to start.

Another technique that works is to bid on a job that you know you will lose money on—bid so low you know you're bound to get the contract. Perform well, and it will be a lot easier to sell the next time—at an equitable (profitable) price. This is really buying your way in.

Some companies are getting into the missile business by buying or merging with other companies that are already in the business. There's been a lot of this sort of thing lately. Still others get together in groupings where, between them, they offer a comprehensive ability. This is a device for those who already know the missile business but who want to improve their competitive position. A recent action involving both of these devices is the merger of Thiokol Chemical Corp. and Reaction Motors Inc., on the one hand, and Thiokol's agreement with Callery Chemical on the other. The merger gives Thiokol both solid- and liquid-rocket capabilities; the agreement gives both rockets high-energy boron fuels.

The business of studying the market carefully can't be overemphasized. So many peculiar problems plague missile development and production, there is no way of forecasting just where a better solution will come from.

For example, take solid-propellant rockets. There are two real posers which beg solution. Most solid-propellant grains (the actual charge) are bonded with a rubber-base material. Below certain temperatures, these get brittle and crack and instead of a rocket you get an explosion when you fire it. This means that solid rockets have to be heated when transported through cold climates. This is costly and a nuisance in the field.

One company, however, has come up with a rubber polymer that retains its characteristics (including flexibility) down to −120°F. This could be a valuable answer to a tough, costly problem. It could also mean profits to the developing company. First step, get a contract from the Government to see how it works as a binder.

These are just two examples of what researching the market can bring up. There are thousands of such problems plaguing the missile industry. Helping to solve them is one way to break into the business. But again, be specific in stating exactly what it is you propose to do and how you plan to set about doing it. There's a place for you in missiles, if you just go after it the right way.★

SPUTNIK NOT SO SECRET

by Dr. Victor P. Petrov

The first Soviet Sputnik *surprised us on October 4, 1957, when it was successfully launched by Soviet scientists and went into orbit around the earth. In addition to the initial surprise of the launching of this satellite, we were shocked to learn that they had managed to put into orbit a vehicle more than eight times heavier than the one we expect to launch in March. Then, another surprise—the launching of the second* Sputnik *on November 3, 1957, weighing (according to Soviet sources) more than a half ton and containing a live dog, as Soviet Academician Sedov had predicted (m/r, Nov. 1957). This time the satellite weighed almost 50 times as much as ours, which was still on the ground.*

We know very well that the Soviets are secretive, and the officials of the International Geophysical Year program probably were peeved at the Soviets' inability to supply the organization with particulars on the scientific instruments aboard *Sputnik* I. American Minitrack stations had to make hurried changes *post factum,* after *Sputnik* I was already in its orbit. However, knowing this tendency of the Soviets, we should have been more alert. A diligent and painstaking study of Soviet periodicals, and especially technical and scientific magazines, could have given us some valuable information.

For example, we were indignant at the Soviet scientists' failure to inform us beforehand of the frequencies on which the radio transmitters of *Sputnik* I were to send their messages back to earth. However, even with all this secrecy, we could still have learned about their plans to use frequencies of about 20 and 40 megacycles. The June 1957 issue of the magazine RADIO, published for the benefit of Soviet radio amateurs, specifically mentioned that the first earth satellite would have two radio sets operating on these frequencies with about one watt strength. Furthermore, four months before the launching we could have learned that the radio messages from the satellite were to be of 0.05- to 0.7-second duration and spaced in such a way that the messages on one wave length would emanate during the pauses on the other.

This same article also explained that changes in the physical conditions during flight would cause a consequent change in the form of the transmitted radio signals, but that these changes would be discernible even to amateur radio operators. To assist the amateurs in recognizing the possible forms of transmission and changes in them, a chart was provided. This chart, resembling an oscilloscope image of the signal, would have been of great help to our scientists if available to them at the time. The article even alerted the amateurs to watch for the radio signals transmitted by the satellite.

Another article in the same issue of the magazine impressed on the radio listeners the importance of recording the *Sputnik* signals on a magnetic tape and synchronizing it with the exact time. The length of dots and pauses thus registered would give valuable information about certain processes on the *Sputnik* itself.

Sputnik II, of course is more interesting, if only for the fact that it is of greater dimensions and weight and carried a live dog. The greater space within this satellite allowed for more instrumentation. It should be noted that the dog was not sealed in the satellite without preliminary and extensive experimentation. We had, of course, known that the Soviet scientists were experimenting with dogs in rockets but information was fragmentary. In June, 1957, detailed information on these experiments could have been obtained from the annals of the Soviet Academy of Sciences. The Soviet rocket specialist Academician Blagonravov stated in an article that experiments had been conducted with animals since 1951.

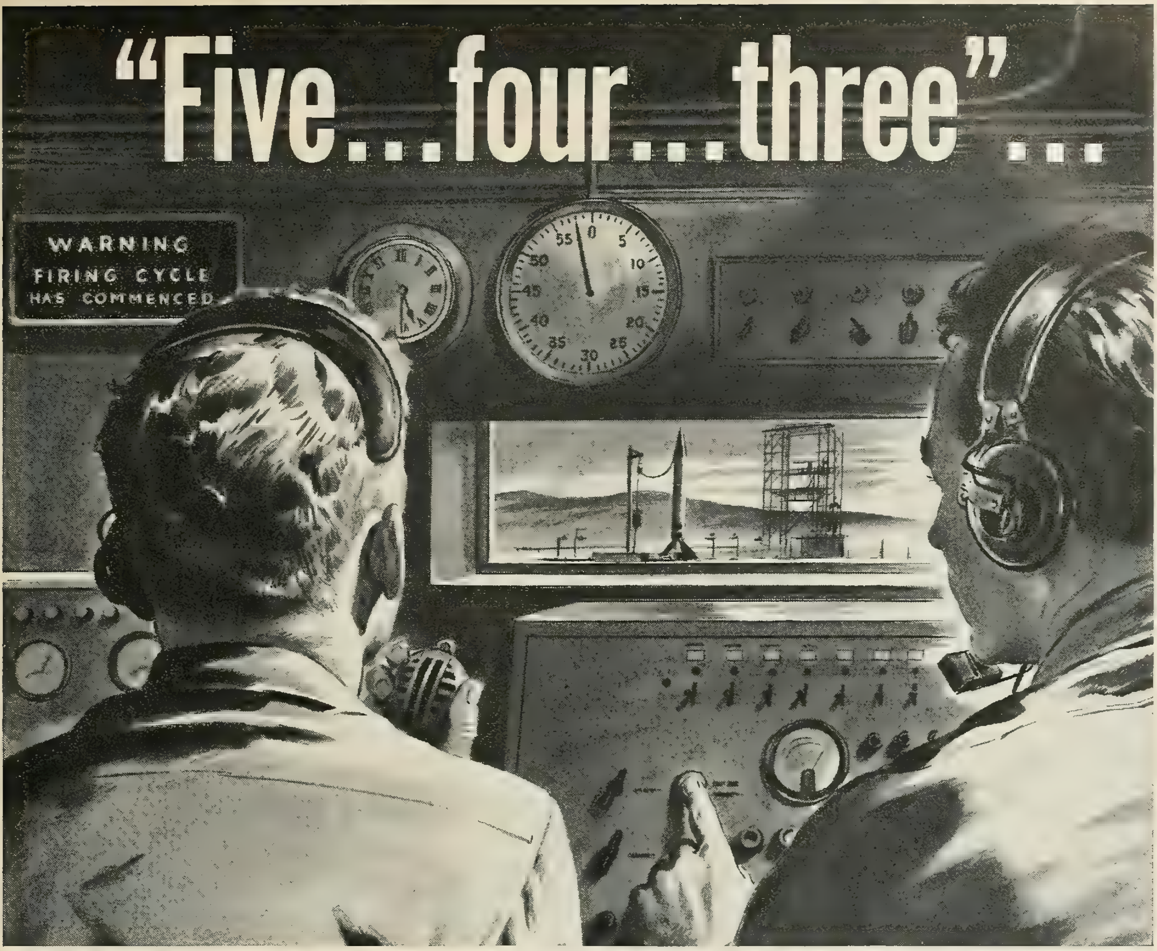
Originally, rockets were sent up to a height of 62 miles at a speed of 3850 feet per second. At the top of its trajectory, the cabin with the animals was detached from the rocket and was in free fall until it reached an altitude of two to two-and-one-half miles. Then its parachute system automatically came into action.

In later experiments, the animals were placed in sections of rockets which were not hermetically sealed. Special helmets, through which they received oxygen, were placed on their heads. They were then harnessed to special "carriages" which had all the necessary apparatus as well as parachutes. A supply of 550 cubic inches was provided—enough for two hours. At the top of its trajectory—a height of 60 to 70 miles—the rocket separated from the nose section containing the animals. The nose section then was in free fall to a height of about 55 miles, at which altitude a carriage containing one dog was catapulted from the section at a speed of 2300 feet per second. Three minutes later, the parachute opened. The second dog remained in the falling rocket nose until it reached an altitude of 25 to 30 miles, where the carriage was catapulted at a speed of 360 feet per second, and continued in free fall to a height of two-and-one-half miles, when its parachute opened.

The movies taken automatically during the entire experiment indicate that the animals were very calm during the flight, and only a few of them were disturbed at times of excessive vibration. In several cases the dogs just slept. No significant changes in the behavior or basic functions of the animals or their systems were observed.

Even before their first *Sputnik* was in orbit, Soviet scientists freely discussed the possibilities of observation of plants and animals aboard future *Sputniks*. The fact that the first *Sputnik* would be heavier than the *Vanguard* satellite was indicated in IZVESTIA two weeks before the *Sputnik* was launched. It was also divulged a year ago that experiments with various animals—mice, rabbits and monkeys—would be conducted in three-stage rockets. While the monkeys were in the upper atmosphere, scientists continuously observed their pulse, blood pressure in arteries and veins and made electrocardiographs. These observations, it was claimed, would be very "important for setting up future interplanetary flights with the participation of men." ★

Dr. Petrov, who has authored articles in England and Germany, is a professor in the U.S. Naval Postgraduate System.



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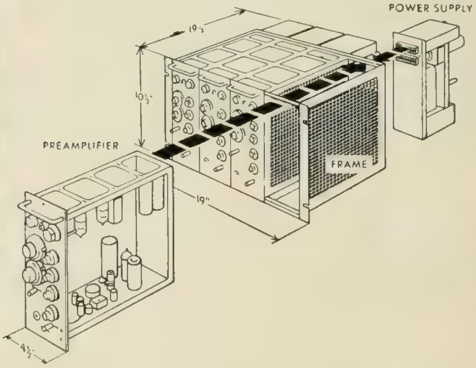
Model 450-1300A
DC Coupling Preamplifier

Here are the newest of the recently introduced Sanborn "450" Series Unit Preamplifiers—compact, lightweight, self-contained instruments for use with optical and tape recorders, wide band 'scopes, panel meters, computers, etc. (For use with high speed optical galvanometers at frequencies above 500 cps, requiring larger current swings, a transistor output amplifier is built into the 450-1800A True Differential DC type and available as optional equipment on other 450's.) As with all 450 Unit Preamplifiers, the new Servo Monitor and DC Coupling models mount in either individual portable cases or in the four-unit 19" module frame (#354-1100-C2) shown. The *450* designation refers to *unit packaging* of Sanborn 350 Preamplifiers and Power Supplies in individual 450 cases. Loosening two front panel thumbscrews allows quick, simple interchangeability. Since *all* "450" Preamps use the 350-500 Power Supply (which remains in place at the rear of the frame or case), new requirements necessitate only additional *Preamplifier* units, permitting sizable savings in equipment investment.

The Model 450-1200 is a phase-sensitive demodulator, whose DC output voltage is proportional to the in-phase (or 180° out-of-phase) component of an AC signal with respect to a reference. Precision measurement is realized by such characteristics as negligible quadrature signal error, provision for floating signal and reference inputs, front panel VTVM for accurate calibration signals. The 450-1200 accepts the outputs of resolvers, synchros, differential transformers and other transducers. The 450-1300A is a moderate gain, balanced input—balanced output DC amplifier. Its input circuit performs equally well with single-ended or balanced signals.

The "450" Series Unit Preamplifiers presently include the Model 450-1100 Carrier, 450-1200 Servo Monitor, 450-1300A DC Coupling and 450-1800A True Differential DC types. Following these will be "450" Series Logarithmic and Low Level types. Further data and application information on present models is available on request.



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MODEL 450-1200 **SERVO MONITOR** PREAMPLIFIER

Sensitivity: 5 mv (in phase) produces 1 volt at output jack under maximum output load conditions
Input Impedance: Signal 100k
Reference 12.5k for 15 volts, 55k for 120 volts
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Carrier Frequency Filter: Selected by a switch (three positions)
Low 60 cycles
Med 400 cycles
Hi 1000 cycles (5000 cycles optional)
Reference Voltage: Internal selection accepts voltages from 15 to 120 volts
Quadrature Rejection: Ratio better than 100:1
Maximum permissible quadrature before overload indicator lights is twice full scale (in phase)
Calibrate Voltage: 10 millivolts internal (set by meter on panel)
Drift: Less than 0.1% of full scale per hour
Preamplifier Output Jack: ±3 volts available into 2.2k minimum load resistance. Output appears across two cathodes at approximately ground potential
Rear inputs and **overload indicator lights** are included
Output Impedance: 1k
Overall Linearity: ±¼%
Power Requirements: 115 volts, 50-400 cycles, approximately 35 watts

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MODEL 450-1300A **DC COUPLING** PREAMPLIFIER

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Input Impedance: 5 megohms each input side to ground

Input: Single-ended or push-pull

Preamplifier Output Jack: ±3 volts into 2.2k minimum load resistance. Output is balanced and appears across 2 cathodes at approx. ground potential

Output Impedance: 1k

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aluminum: For Missiles in Production

by Don Fabun

SO MUCH has been published about the use of rare or lesser known materials in missile design that the fact often is overlooked that the "workhorse metal of the air age"—aluminum—is playing an integral part in missile programs from *Atlas* to *Zuni.*

Several months ago, a comprehensive survey was undertaken in Kaiser Aluminum & Chemical Corp. to determine just where and how aluminum is being used in current missile programs and what its future market potential might be.

In some cases, security restrictions on missile details made the search difficult; many of the prime contractors were already in the aircraft business and already buying aluminum, so that there was no easy way to tell whether the metal was going into aircraft or into missiles; and, finally, the entire missile industry is so complicated that tracing the progress of a single order of metal through the network of contractors and subcontractors was often impossible.

Nevertheless, from the information gathered so far, some interesting points can be developed:

Aluminum is being used in significant quantities or in critical areas in more than half of all the missiles that have reached the production stage today. The percentage would undoubtedly be higher if information was available on all missiles.

A composite rocket that would be reasonably complete could be built from parts of rockets now being made of aluminum. Such a composite would include aluminum airframe, skin, wings, wing spars, nose cone, tail, fins, brackets, wiring systems, fuel tanks, motor heads, rocket motor tubes, solid-propellant core molds and electronic components in the guidance system.

Substantial quantities of aluminum also are being used in the ground fueling apparatus for liquid fuel rockets (as for the external skin for *Thor* LOX storage tanks), in missile weapon carriers, launching ramps and launchers, ground guidance systems, tracking and control systems, reusable containers for shipment and storage, and in attachment pads and devices for all types of airborne missiles.

Just about every major form in which aluminum is available is used in the missile programs: sheet, plate, castings, extrusions, forgings, rod, bar and wire, electrical conductors, insulated wire and foil.

There are good reasons for this across-the-board aluminum usage: lightweight (one-third that of the same volume of steel); versatility; some 26,000 firms with the know-how and equipment to work with aluminum; low maintenance factor; and, finally, its economy as a structural metal.

These considerations have led to the so-far-revealed uses of aluminum in current production or operational missiles shown in the accompanying table. The figures in the table were secured through direct contact with the public information officers of each of the appropriate services, or by direct inquiry to the prime or airframe contractors.

There is additional usage of aluminum in most of the missiles which have built-in guidance systems, but the weight for any specific unit would not materially affect the total aluminum in each missile.

Knowledge of this market's potential is of particular interest to the aluminum industry at the present time because it has been engaged for the last several years in a major expansion of primary aluminum producing facilities. One reason for the aluminum industry's expansion, to begin with, was to create such aluminum producing capacity throughout the nation that there would be enough aluminum to satisfy the needs of even the very largest potential users (automobiles, building trades, cans, etc.) without jeopardizing a reserve capacity for meeting military requirements.

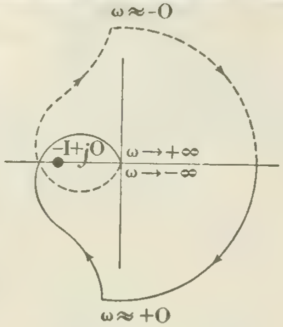
When and if missiles move into

Known Uses of Aluminum in Current Production Missile Programs

Missile	Gross Firing Weight Per Unit	% or Pounds of Aluminum Per Unit
Corporal	12,000 lbs.	4,000 lbs.
Dart	100 lbs.	5%
Falcon	110 lbs.	11 lbs.
Hawk	1,200 lbs.	120 lbs.
Honest John	6,000 lbs.	960 lbs.
Jupiter	100,000 lbs.	17,500 lbs.
Lacrosse	500 lbs.	50 to 50%
Matador	13,800 lbs.	3,200 lbs.
Mighty Mouse	19 lbs.	2 lbs.
Nike-Ajax	20,000 lbs.	2,000 lbs.
Nike-Hercules	20,000 lbs.	2,000 lbs.
Rascal	13,000 lbs.	3,200 lbs.
Redstone	40,000 lbs.	4,500 lbs.
Sergeant	22,000 lbs.	1,320 lbs.
Snark	36,000 lbs.	1,300 lbs.
Sparrow I	300 lbs.	95 lbs.
Sparrow III	350 lbs.	280 lbs.
Talos	3,000 lbs.	500 lbs.
Titan	200,000 lbs.	(skin, hull—wt. not available)
Zuni	107 lbs.	(rocket tubes—wt. not available)

The author is editor, KAISER ALUMINUM NEWS, *at the Kaiser Aluminum & Chemical Corp., Oakland, Calif.*

An Engineer Speaks Out...



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the mass-production "hardware" stage, there will be ample capacity to meet all the normal peacetime aluminum requirements without an allocation program for nonmilitary users of aluminum.

Just how big a market for aluminum will missiles be? Obviously, the exact number of missiles being produced or about to be produced is kept secret, but it is possible to make some sort of a guess in some directions. When the guesses are put together, they indicate that the missile field may well be a large user of aluminum within the next few years.

Something like two pounds of aluminum are consumed every time a *Mighty Mouse* missile is fired. Armament on a fighter-attack plane is 104 rockets (although as many as 196 have been carried by a fighter craft). A full load of 104 rockets can be fired in ripple salvos, electronically, in three seconds. A group of 100 fully armed fighter craft firing continuously, assuming such a feat were possible, would use up one million pounds of aluminum in two and a half minutes.

Such a mass firing is unlikely, but the figures do make an important point. It is highly improbable that the big IRBMs and ICBMs, considering the nature of their payload and mission, will ever be used except in an allout global war. The number of units produced will be relatively limited, and their high per-unit cost will keep the number of test and training firings to a minimum.

The smaller missiles, which more and more are replacing conventional artillery, both on land and sea, are likely to be used up at a brisk rate in training maneuvers and limited-scale actions. The use of aluminum in these missiles is therefore of particular interest to the aluminum industry as a potentially large tonnage market.

How much? There is good backing for coming up with a figure of something like eight million pounds of aluminum in the *Nike-Ajax/Nike-Hercules* programs alone. Just how many of these have been built is classified, but in June 1957, the Army asked the House Appropriation Subcommittee for funds to rebuild 4000 *Nike* missiles in 1958. Since the money was for reconditioning 4000, it must be assumed that 4000 already existed, and, as pointed out in the table of aluminum usage, there are 2000 pounds of aluminum used in each *Nike* booster assembly.

Getting back to the *Mighty Mouse*, in October 1957, a West Coast contractor received a contract for the components for two million of these rockets. At the two pound per-unit rate, that's four million pounds of aluminum in the *Mighty Mouse* program alone.

Matador uses 3200 pounds of aluminum per unit. Although the figure has never been officially confirmed, a newspaper in October 1957, reported that 1000 *Matador*s had been built by that date. There's another 3.2 million pounds.

Adding together just the interpolated figures from these three programs —*Mighty Mouse, Matador* and *Nike-Ajax*—there's a total of 15 million pounds of aluminum accounted for, a figure of considerable interest to the aluminum industry, considering that the missile programs may be said to be just entering the mass-production hardware stage.

Even so, considering the metal's natural advantages for missile construction, it may seem surprising that more aluminum is not being used in missile programming. There are a number of pertinent factors here. For one, until quite recently, missiles have not been a mass production business, where aluminum's low cost and easy workability would recommend its use. In prototype stages, a missile is practically hand-crafted and the time and labor involved far outshadow materials cost. Missile designers have been absorbed in solving problems any way they could, and the materials they chose have not necessarily been picked for economy.

As a missile moves into full-scale production, time and labor drop, relatively, and the proportion of materials cost to the overall cost goes up. Unit figures on production missiles give some idea of what is involved. *Nike* I is said to have cost $20,000 per unit; *Sparrow* III is said to cost about $40,000; the *Falcon* costs $9000 to $10,000; the *Terrier* about $40,000 each; *Bull Pup* $10,000 and *Redstone,* $1 million per unit.

If the United States is to have these relatively short range, artillery-replacing missiles in quantities sufficient for adequate defense, price per unit is going to be an increasingly important factor. Aluminum's low basic price, easy machinability and light weight will recommend its use wherever possible to cut unit costs.

Perhaps another reason aluminum has not appeared to play the role in missile construction for which its characteristics fit it, is the "heat barrier" controversy, which has served to create in the minds of some designers and engineers a mental barrier against aluminum "because it can't stand the heat."

The basic premise here is that aluminum begins to suffer measurable loss of strength above 400°F. Since the surface heat of a missile during prolonged periods of exposure to air friction may rise to several times that figure, the argument goes, some better high-temperature metals (like titanium, molybdenum, zirconium, thorium, etc.) are needed.

Valid as the original premise may be, the argument overlooks two significant points. The first is that the practical limit for structural use of any metal is of the order of 2000°F. Since, at very high Mach numbers in the atmosphere, the surface temperature of missiles will exceed that, finding new materials is not going to be the answer. Instead, the heat barrier may be bypassed through redesigning flight paths and through skin-cooling devices.

A few weeks ago, a missile engineer at a major missile contractor's said, unequivocally, "Aluminum is back in the picture (for missiles). Since we can't solve the heat problem just by substituting high-cost materials, we're going to have to go back to aluminum and solve it with new designs and flight paths."

Since the greatest problem occurs during the period of traversing the dense atmosphere during blastoffs, some suggestions have been made for firing missiles at an altitude where air friction is not a problem.

Another consideration in the "heat barrier" argument is the length of time of exposure to elevated temperatures. Artillery-type missiles attain top speeds of Mach 2.5 to 5.0, at critical portions of the flight path. At these portions, friction of the atmosphere will develop high skin temperatures. However, the time of sustained high skin temperature is very short.

At Mach 3, for a missile intercepting at a 30- to 50-mile range, the actual exposure to high temperature is a matter of only several seconds, and most of this in the nose area. For high trajectory ICBMs or IRBMs, the time of sustained high temperatures is limited to the few seconds it takes for the missile to leave the atmosphere. Skin friction is not too critical at very high altitudes, in the rarified air found there. The short time (up to 60 seconds) of high temperature may not be as detrimental to aluminum as the standard physical test data developed for aircraft may indicate.

The aluminum industry is now working to develop complete information on the effects of high temperatures for short periods on aluminum.

All these factors: aluminum's already important role in missile design, its low cost, wide availability, workability, and the promise of even improved qualities to come through research, argue for a greater part for aluminum in missile development as the programs shift into high gear.★

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Sandwich Rolling for Wide Steel Sheets

US Steel uses new method to fabricate thin-gauge metal

THE US STEEL CORP. recently announced that a major breakthrough in metal fabrication has been attained at its Homestead Works.

Experimental "sandwiches" of stainless-steel plates inside and carbon-steel plates outside are sealed by machine welding to hold the plates together. A special separating compound is applied to each of the plates before assembly to prevent fusing during the rolling process.

At the outset, the "sandwich" is three inches thick, but is reduced to about 10 per cent of its original width after being hot-rolled. After rolling, the ends and sides of the "sandwich" are sheared off and the carbon-steel covers removed to free the wide sheets inside.

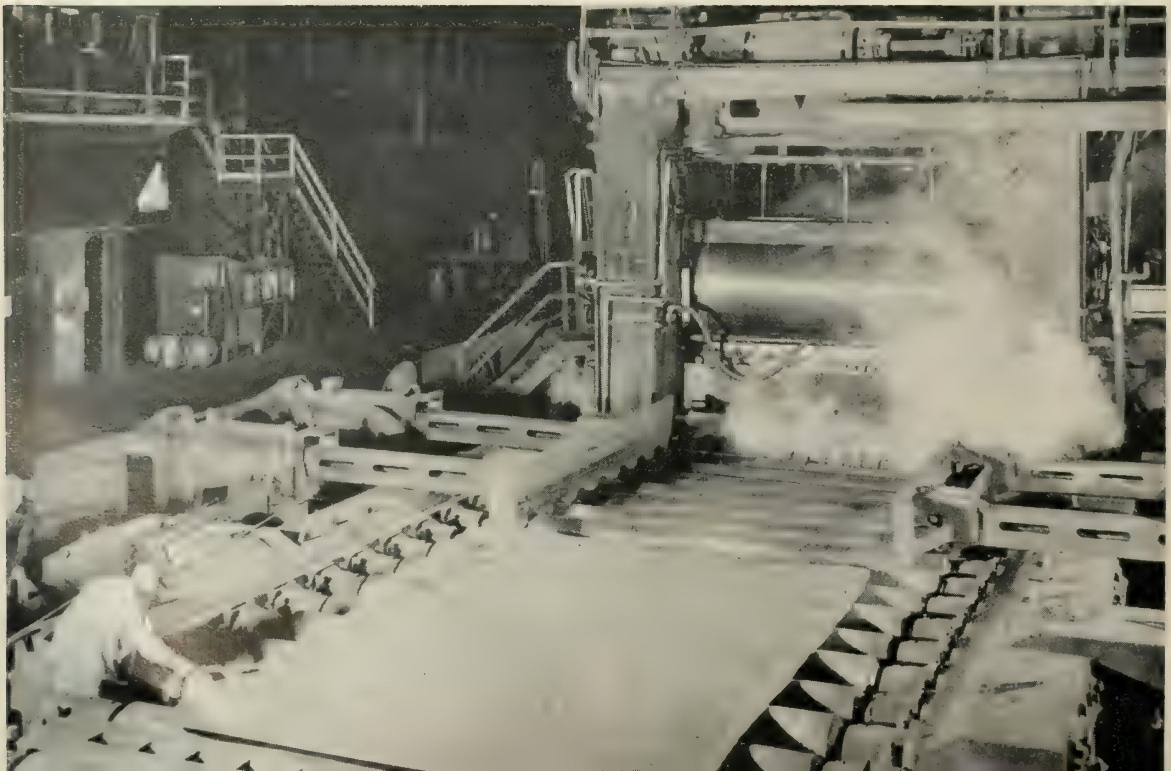
This new technique was developed under a research and development program designed to find means of producing wide thin-gauge stainless- and alloy-steel sheets for missiles.

Experimental runs with this technique have produced sheets 90 inches wide and 230 inches long—about twice as wide as sheets produced by ordinary production methods.

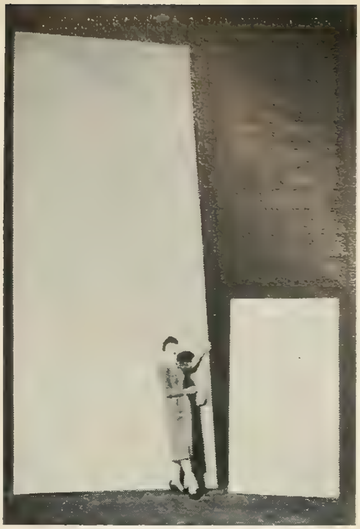
The real key to the process is the carbon-steel covers which insulate the stainless and alloy plates they enclose and keep the material at favorable rolling temperatures. This has allowed US Steel to produce the wide sheets on existing mill equipment.

This new process holds promise of better mill-produced materials for planes and missiles. Further studies to produce even wider and longer sheets of quality equal to the present ones are currently in progress.

Below—After heating and rolling, the "sandwich" resembles an ordinary mill product as its thickness is measured by a workman.



Near right—Fully assembled group of carbon-steel and stainless-steel plates are tack-welded prior to machine welding, which will seal all four sides. Far right—Comparison of conventional-rolled, 48-inch heet and sheet being produced by experimental process at US Steel. Larger sheet s 90 inches wide and 230 inches long, nearly double the width of regular sheet. Below—Workmen at Homestead District Works lower carbon-steel cover plate onto "sandwich" filled with stainless-steel plates. Hot-rolling will reduce thickness to 10 per cent of original. Several groups of plates have been rolled during this research and development program.



Above—Workman at Homestead Works coating stainless-steel plate with a special separating compound during the assembly of carbon-steel and stainless-steel "sandwich." Use of this compound prevents fusing of the metal plates during the hot-rolling process. After rolling, ends and sides of the carbon plates are sheared away; the resulting stainless plates are the widest ever produced on existing mill equipment. Left—Inspector examines finished stainless sheets after rolling.

CASE HISTORY SERIES: Number ②

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GUIDED MISSILE RELIABILITY

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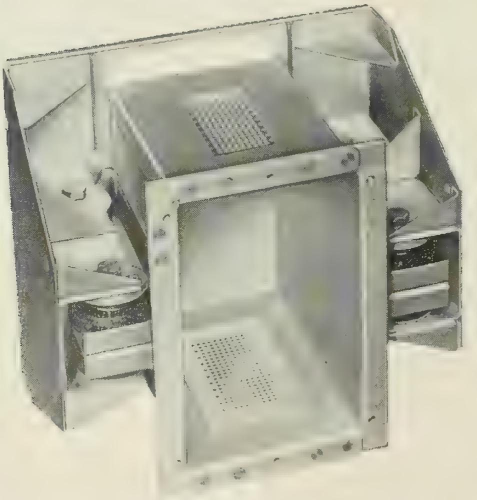

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in the missile era . . .

Materials Build a New Technology

by W. C. Rous, Jr.

IN THINKING about earth satellites or even hypersonic rocket gliders, structural and materials people are concerned, among other things, with operational stress and temperature histories in relation to design requirements. Of necessity, this kind of thinking is based on many assumptions which vary with personal opinions.

Beginning with takeoff, rocket-thrust variations are programmed for considerations of flight mechanics and structural strength. Variations in stress occur during the boost phase, depending on the number of rocket stages being fired in parallel and in sequence. Generally, the stress on a rocket-propelled vehicle varies most rapidly and is greatest during boost. In heat content, however, the maximum temperature is usually encountered during reentry into a planet's atmosphere.

A number of magazine articles have been published indicating typical temperature which might be encountered. For example, during the first boost stage, the skin temperature about one foot from the leading edge might reach a temperature of the order of 500°F. After all the rockets have been fired, the temperature may rise to about 1000°F. Depending on configuration, the temperature may then rise to about 1500°F magnitude sometime after burnout.

Critical design criteria include the relationship between skin temperature, amount of required cooling, and structural weight as indicated; relationship of time with nose equilibrium skin temperature; temperature of an insulated skin, a heat skin and a transpiration cooled skin. Equilibrium temperatures could be of the order of 2000° to 3500°F at leading edges.

Structural weight and cooling load compromises are possible with a radiation-cooled, or a high-skin-temperature structure. If the structure is highly conductive, the heat transfer to the interior will be high, but the skin temperature will be low, resulting in a low structure weight and a high internal cooling load.

As the structure is made more insulating, the heat transfer through the structure into the interior will decrease, and so will the cooling load. However, the skin temperature will increase, requiring heavier structure. An optimum skin temperature is sought where the combined structural weight plus the internal cooling system weight will be a minimum.

An optimum balance must be attained between the structural and coolant weight, and the rate of coolant flow for a transpiration-cooled structure. At low coolant flow rates, the structural weight will be high and the coolant weight itself will be low. As the flow rate is increased, the structural weight decreases because the skin temperature will be lower as the coolant weight increases.

These environments constitute the problem. For primary structural materials, Figs. 1 and 2 present evaluation of possible materials as published in recent literature.

In Fig. 1, titanium and carbon steel will probably not be used extensively as construction materials. Stainless 347 is recommended by handlers of fluorine,

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The author is Senior Manufacturing Research Engineer at Convair, Fort Worth, Texas.

Structural Material	Outstanding Temp. Range (°F)	Significant Characteristics	Availability: Current Status	Availability: Probable Future Status	General Processing Procedures	Potential Development
Titanium 6Al-4v	R.T.-800	Superior str/wt below 800°F; embrittlement-susceptible	9 months lead time	Good	Heat-treated @ 1750°F; aged @ 1000°F for 2 hrs.	Limited
Carbon steel:						
Hy-Tuf	R.T.-500	Heat-treatable; heat-vulnerable	Good	Good	Forged or rolled; heat-treated @ 1650°F max. tempered 450-1075°F pending use	
4130	R.T.-500	Heat-treatable; heat-vulnerable	Good	Good		
4340	R.T.-500	Heat-treatable; less heat-vulnerable	Good	Good		
Stainless steel:						
301	R.T.-550	General low-temp. utility	Good	Good	Cold- or hot-worked	Limited
316	R.T.-1200	General use; corrosion-resist.	Good	Good	Cold- or hot-worked	Limited
347	R.T.-1300	General use; corrosion-resist.	Good	Good	Cold- or hot-worked	Limited
17-7RH950	R.T.-800	New superior stainless	Limited	Good	H.T. @ 1750°F, cooled to 100°F, aged @ 950°F	Limited
Alloys:						
Udimet 500	800-1700	Superior str/wt of Ni, Cr, Co alloys	Limited, unevaluated	Probably good	Vac.-Cast; H.T. 1975°F; age 1550°F, 24 hrs; age 1400°F, 16 hrs.	Little
Inconel X	1000-1500	Practical; efficient; corr.-, ox.-resist.	Satisfactory	Good	Arc-cast; H.T. 2100°F, 4 hrs; 1500°F, 24 hrs; 1300°F, 20 hrs.	Little
Inco. 700	1000-1500	Slightly superior to Inconel X; similar	12 mos. lead time; bar only	Similar to Inconel X	Arc-cast; H.T. 2160°F, 2 hrs; 1600°F, 4 hrs.	Little

Fig. 1—Ferrous and nonferrous structural materials.

but is not currently satisfactory for structural use due to its strength and availability status.

Inconel X and Udimet 500 have good characteristics in the superalloy range of application. The current availability of Udimet 500 is limited, but its strength-to-weight ratio in the 800 to 1700°F temperature range is best.

Figure 2 indicates considerable potential for molybdenum. Its ductility and strength from 1700°F up to perhaps 2600 to 2800°F make it an excellent choice in regions of high heating rates and high temperatures, and where thermal stresses must be combined with stresses due to aerodynamic loads.

Adequate protection from oxidation must be provided for molybdenum as well as other efficient materials which are feasible for high-temperature structural use. Although molybdenum's behavior at very low tempera-

Structural Material	Outstanding Temp. Range (°F)	Significant Characteristics	Availability		General Processing Procedures	Potential Development
			Current Status	Probable Future Status		
Molybdenum (Mo+5 Ti)	1700-2600	Only current useable alloy above 2000°F; best E/ρ from R.T. & up; high conductivity	Limited; difficult processing	Fair; pending development	Vac-cast; cold-rolled	Considerable
Tungsten	2400-4000	Poor ox. resist. 900°F & up. Dense, strong up to temp. limits; brittle	Gen. avail. limited quantity	Fair; potentially on critical list	Powder metall.; hot-formed	Limited; unpredictable
Tantalum	2400-4000+	Poor ox. resist.; dense, strong up to temp. limits; ductile, corrosion-resistant	Gen. avail. limited quantity	Unpredictable; critical material	Powder metall.; cold-formed	Performance good; avail. unpredictable
Rhenium	2400-4000+	Good ox. resist.; dense, strong; little data	Very rare	Unpredictable; scarce	Powder metall.	Performance good; avail. unpredictable
Carbon	3000-5000+	Best str./wt. above 3000°F; brittle; poor ox. resistant	Good	Good	Molded; baked @ 2300°F	Limited
Cermets (Ti C+Ni, Cr, Co)	1800-2500	Marginal impact strength; good oxidation resist. to 2200°F; good resist., thermal shock, high strength, stiffness	Good; some design & matl. development needed	Good	Powder metall.; finish grinding	Limited; somewhat unpredictable
Ceramics oxides	2500-4500	Critical thermal-shock resist.; critical impact strength; superior oxidation resist.; superior comp. str./wt.; poor tensile strength; low elec. conduct.	Good; design & matl. dev. needed	Good	Powder metall.; finish grinding	Very limited; unpredictable
Carbides		Low thermal shock resist.; low impact str.; marginal oxidation resist.; superior compr. str./wt.; poor tens. str.	Good; design & matl. dev. needed	Good	Powder metall.; finish grinding	Very limited; unpredictable
Reinforced plastics	200-600	Medium impact resist.; readily formed; low elect. conduct.; adequate str. for limited use	Good	Good	Fiber laminate; plastic-impregnated; hot-press cured	Limited by low-temp. capacity

Fig. 2—Refractory structural materials.

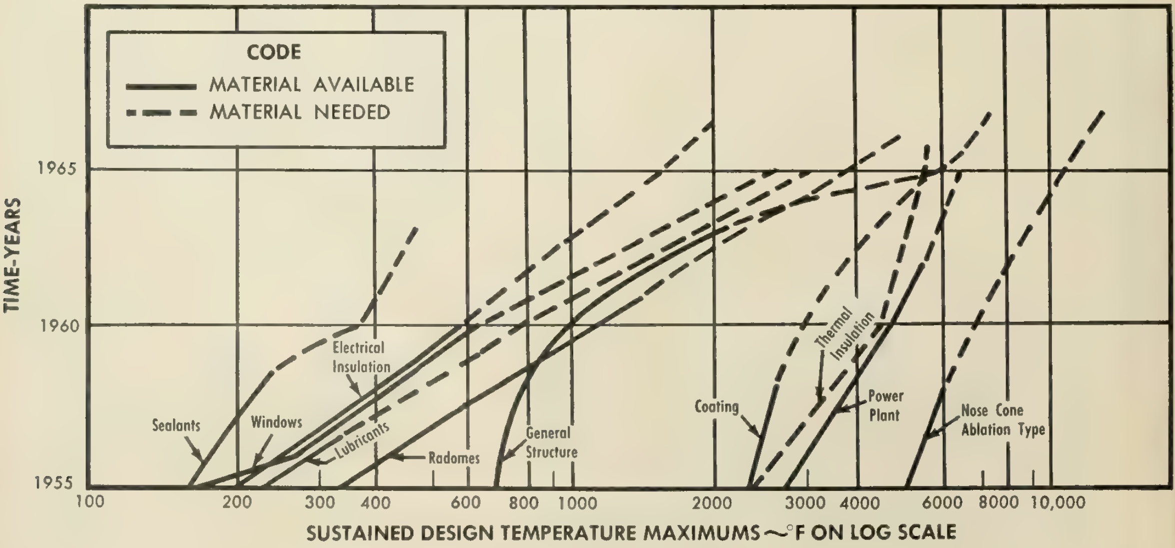
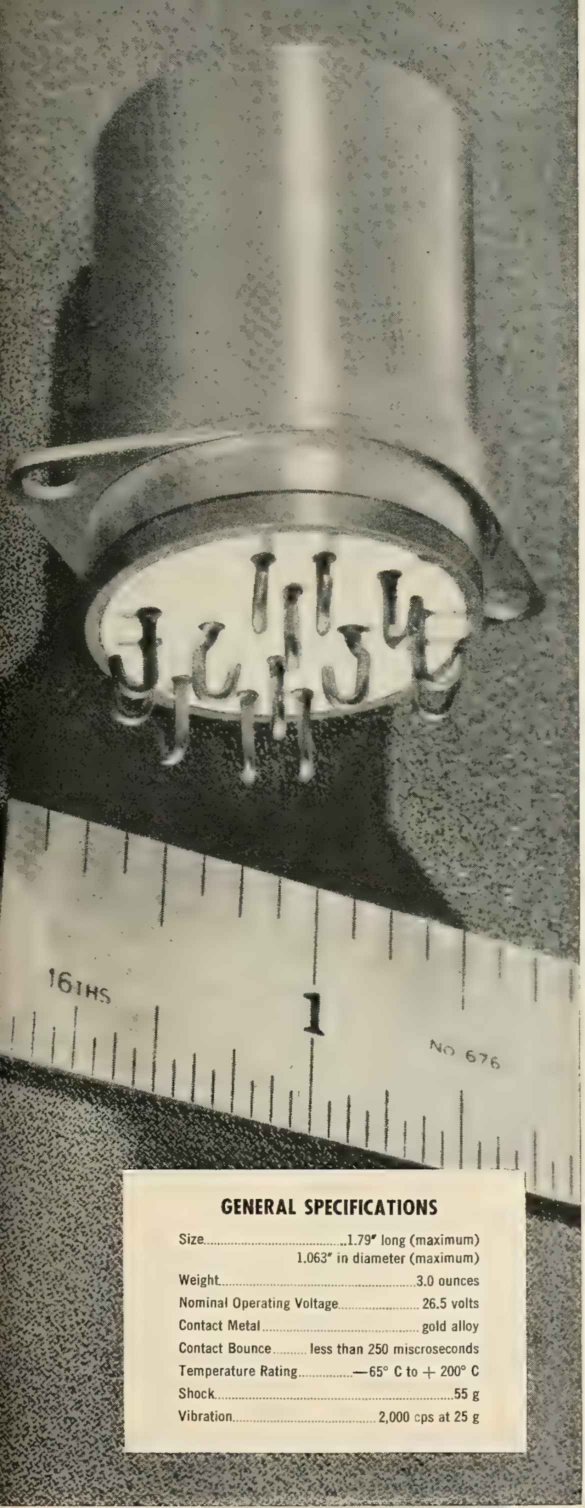


Fig. 3—Material development needs.

FOR THE FIRST TIME



GENERAL SPECIFICATIONS

Size	1.79" long (maximum) 1.063" in diameter (maximum)
Weight	3.0 ounces
Nominal Operating Voltage	26.5 volts
Contact Metal	gold alloy
Contact Bounce	less than 250 miscroseconds
Temperature Rating	—65° C to + 200° C
Shock	55 g
Vibration	2,000 cps at 25 g

a new 4PDT relay to meet all requirements of MIL-R-25018!

Don't compromise with the Class C, Type II, Grade 3 requirements of MS 24114-9, MIL-R-25018. You don't have to any more. Now Union Switch & Signal has a 4PDT, rotary-armature relay designed to meet these specifications *completely*. It is the first of its type to do so. In fact, it *exceeds* some of the rugged requirements.

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Contact reliability is enhanced, too, by the ceramic insulation which contains no volatile material to contaminate contacts and by separate hermetic sealing of the magnet coil.

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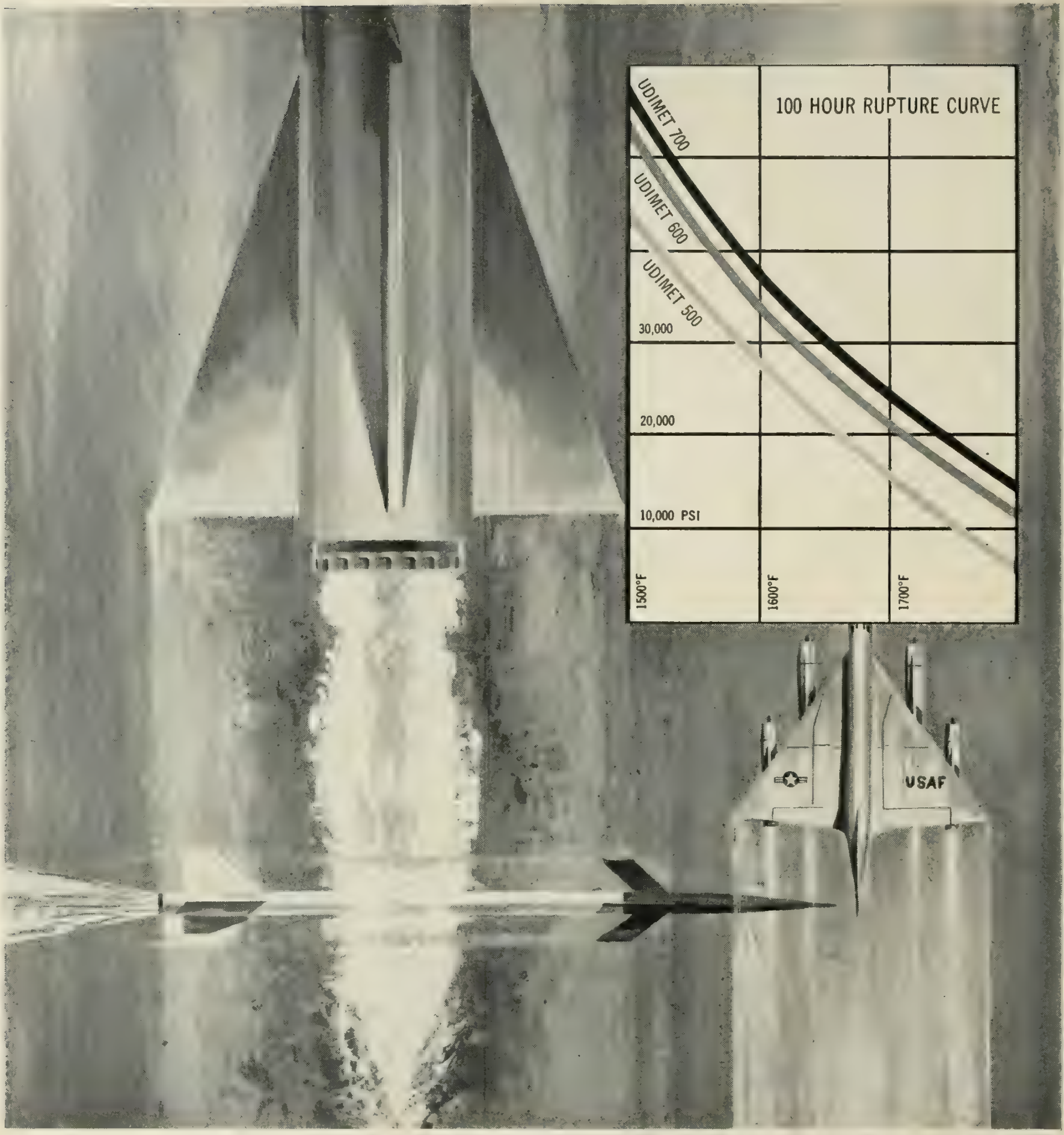

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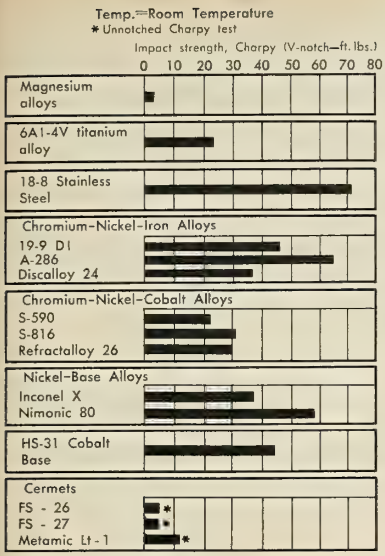


Fig. 4—Comparison of impact strength of various structural materials.

ture requires further investigation of its brittle, stain-rate and notch-sensitive characteristics, its use seems feasible.

Development of adequate coatings for molybdenum amounts to a major engineering effort. A number of manufacturers are spending considerable effort on this problem.

Tungsten, tantalum and rhenium all have very high-density and high-temperature resistance. They are very scarce, are difficult to produce in specific shapes and their future development is unpredictable. Their use would be restricted to local structural components.

Carbon has the best strength-to-weight ratio above 3000°F. Its availability is good, but its potential development is probably limited. Carbon and carbides would also probably be restricted to local use.

Cermets and ceramics have good temperature-resistant characteristics. Their greatest disadvantage is their inherent notch sensitivity and poor impact strength. The value of ceramics, particularly oxides, is their oxidation resistance. Their greatest use will probably be as coatings for efficient structural materials, and as parts subjected to high temperatures, but low or nonexistent stresses.

Existent ceramic coatings are used to: (1) substitute less strategic alloy without sacrificing life; (2) increase life of existent parts; (3) allow use of existing parts at higher temperature.

In their use, these coatings take the following forms: (1) refractory coatings (*viz.*, for tank mufflers, 3 to 8 mils thick); (2) very thin vitreous coatings (NBC A-418 for jet parts); (3) refractory oxide, carbide or nitride cermet coatings (Ni-MgO flame-sprayed coat for combustion liners); (4) refractory insulating coatings attached to base metal by cementing or by mechanical means; (5) "ceramic paints" which can be brushed on and require no firing prior to use.

Less progress has been made in evaluation of mechanical and thermal properties of nonstructural materials than on primary structural materials. This status is indicated in Fig. 3 and may be outlined as follows:

Radomes

Glass fibers impregnated with silicone resins are limited to about 900°F. Radomes of Al_2O_3 are usable to 1500°F. Pyroceram 8606 has good strength up to 1500°F. These materials appear favorable strengthwise for anticipated radome temperature of 1200°F for one and one-half hours. Simple surfaces and flush mounting in design favor use of ceramic dielectrics.

Potential methods of ceramic randome fabrication are (1) Solid-wall high-temperature glass, high-temperature porcelain, high-temperature synthetic mica (with a glazed surface), and high-temperature sintered Al_2O_3 or Zr_2O_3; (2) ceramic air-spaced sandwich (with ceramic internetwork for rigidity); (3) inorganic cement plus glass fiber; (4) glass foamed in place sandwich and artificially loaded foams.

Windows

The need for windows is not established one way or the other. Successful development of a solder glass interlayer may extend temperature usage from the present 350° to 800° or 1200°F. If better scratch-resistance could be built into solid glass, temperature limits could be raised to 1500° or 1800°F, and even 2500°F, for short periods. Glider windows protected by cooling, or eyelids, which can withstand 1800°F, may be useful.

Seals and Sealants

Assumed design life will have

(Continued on page 98)

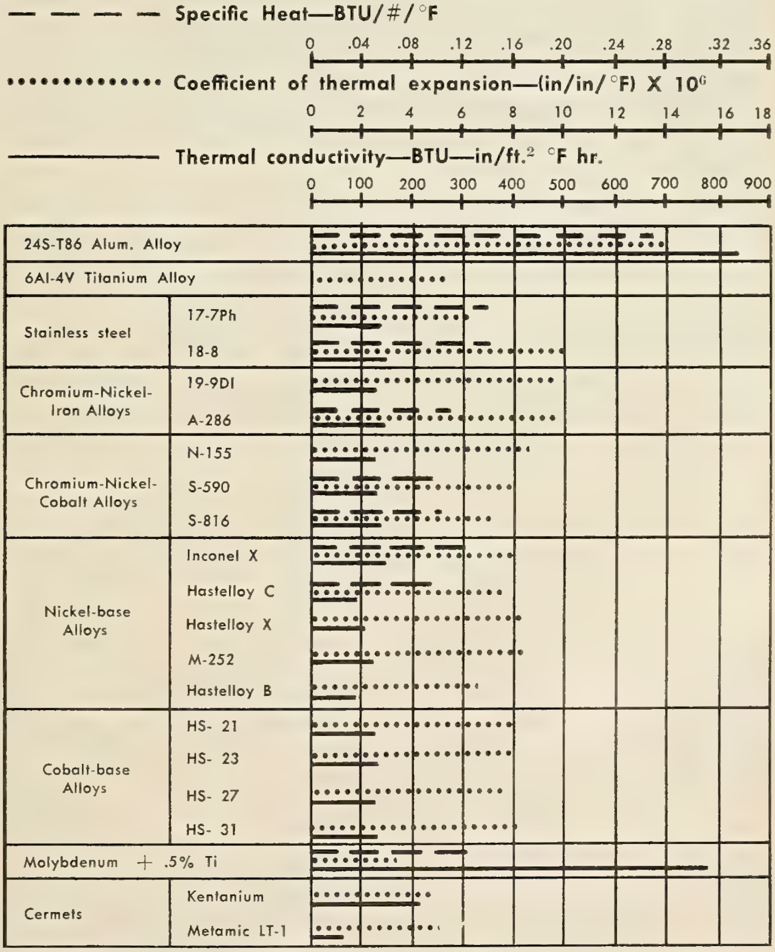
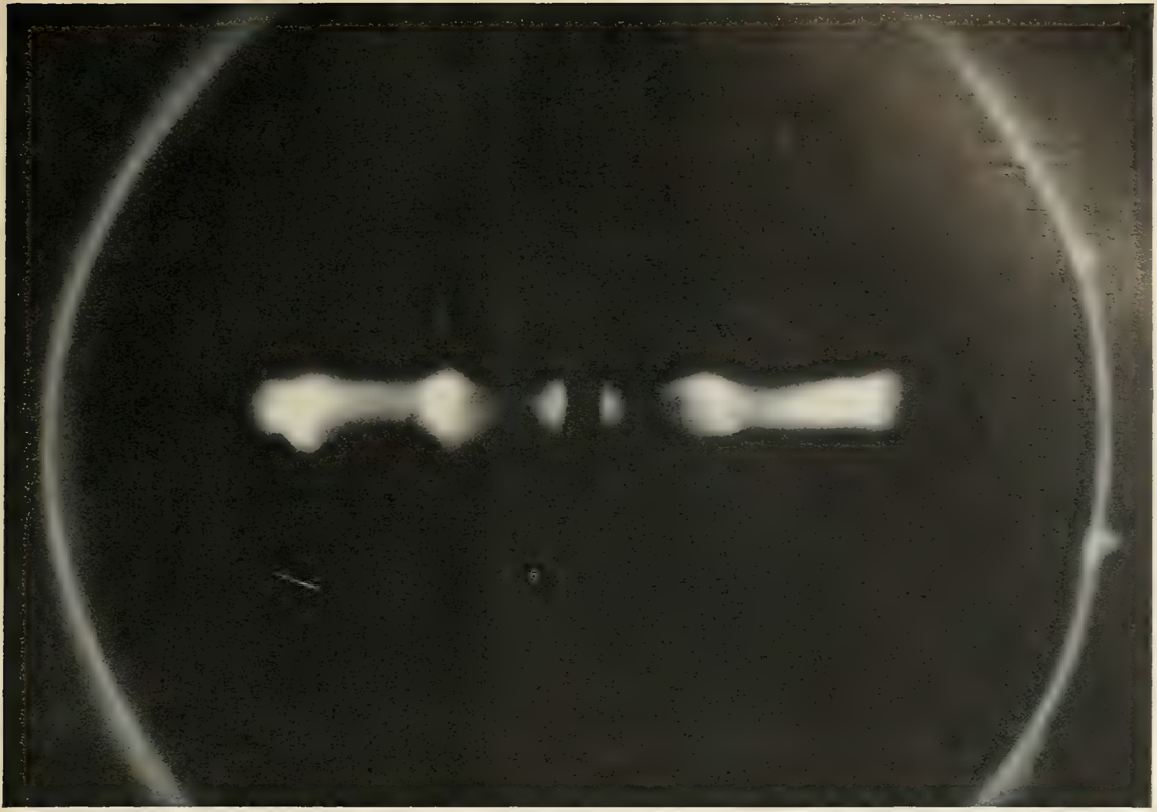


Fig. 5—Comparison of thermal properties of various structural materials, 700°F.

Metal	Melting Point (°F)	Density (lbs/cu. in.)	Characteristics	Short Time Tensile F_{tu} Ksi at —°F	Vapor Pressure at Melting Point (mm. Hg) ((-3)=10^{-3})	Oxidation Resistance in Air	Order of Probable Feasibility for 2000°F Structure	Miscellaneous Comments
Tungsten (W)	6150	0.70	Good: high-temp. strength Poor: oxidation resis., ductility, fabrication	120-300 at R.T.; 32 at 2500°F; 3.4 at 4100°F	1.75 (—2)	Forms nonprotective oxide 900-1400°F; oxide volatile at high temperature	3	
Rhenium (Re)	5750	0.73	Good: high-temp. strength Poor: very scarce	48 at 2500°F; 9 at 4000°F	2.45 (—2)	Resistance is five times cermets at 2500°F	3	
Tantalum (Ta)	5425	0.60	Good: high-temp. strength Poor: oxidation resis. and some mech. properties	50-110 at R.T.; 6.7 at 5000°F	5 (—3)	At 896°F weight gain due oxidation is 1% per 24 hours; poor resistance to air at elevated temperature	2	Softening temperature of 810-1170°F for pure Ta
Osmium (Os)	4890	0.82	Poor: high cost, oxidation resis., unworkable	Approximately 160-200 at R.T.		Rapid oxidation in air at elevated temperature; oxide is volatile		Completely unworkable in pure state
Molybdenum (Mo)	4760	0.37	Good: high-temp. strength, abundant Poor: oxidation resistance	13° at R.T.; 10 at 2500; 5.24 at 4500	2.2 (—2)	Forms volatile trioxide above 930°F	1	With siliconized coat may be used for extended time; with Ni, or Inconel clad use in air to 1800-2000°F
Ruthenium (Ru)	4530	0.44	Poor: high cost	Approximately 115-190 at R.T.	9.8 (—3)	Similar to Ir in corrosion resistance		
Iridium (Ir)	4450	0.83	Poor: high cost	Approximately 100-160 at R.T.	3.55 (—3)	Slight oxidation at 1100-1850°F; oxide volatile > 1850°F		
Niobium (Columbium Cb)	4380	0.31	Good: high-temp. strength Poor: oxidation resis., ductility	48-60 at R.T.	6.4 (—4)	Oxidizes above 500°F in air; forms nonprotective oxide (0.052% wt. gain/5 hours at 662°F)	2	Softening pt. Cb ≅ Ta (800-1170°F)
Hafnium (Hf)	3830	0.47	Poor: very scarce			Oxidizes readily in air, similar to Zr but O_2 penetration into metal is slower.		
Rhodium (Rh)	3625	0.45	Poor: high cost	73-300 at R.T.	1 (—3)	Oxidizes at 1475°F rapidly; oxide volatile > 1830°F		
Chromium (Cr)	3435	0.26	Poor: high vapor pressure	40-60 at R.T.	63.5	Forms protective oxide scale W. maximum temperature stability 1650°F	6 (Alloyed)	
Zirconium (Zr)	3325	0.24	Poor: oxidation resis., med.-high vapor pressure	90 at R.T.	1.4 (—5)	Loss of strength becomes significant above 900°F	5	More plentiful in earth than Cu, Ni, Pb; is 2 years behind Ti development; low neutron absorp. cross-section
Thorium (Th)	3320	0.41	Poor: high-temp. strength, therm.-stress resistance	37 at R.T.; 17 at 900	9.3 (—5)	Highly reactive at elevated temperatures		
Platinum (Pt)	3225	0.78	Poor: high cost	19 at R.T.; 4 at 1800°F	1.6 (—4)	Good to 2700°F for short times; oxide volat. > 1600°F		
Vanadium (V)	3155	0.23	Poor: med.-high vapor pressure	70-110 at R.T.	1.2 (—4)	Above 300°F must be protected from oxide, hydride and nitride formation		
Titanium (Ti)	3140	0.16	Poor: high vapor pressure	90-100 at R.T.	8.4 (—2)	Forms protective oxide scale, embrittles between 1100-1800°F oxide porous; > 1800° oxide may sinter together.		Not recommended for continuous service over 1000°F (At 1800°F 6Al-4V has 95 mg/cm^3/48 hours, cumulative wt. increase/orig. unit area.)

Fig. 6—Status of high-melting-point metals.



Magnetic fields, acting as a double piston, drive luminous ionized shock waves through transparent tube. One-tenth microsecond exposure in STL's Physical Research Laboratory.

MAGNETOHYDRODYNAMICS and SPACE TECHNOLOGY

Magnetohydrodynamics provides one of the most promising approaches for attaining the velocities and specific impulses that will be required for manned space flight to a planet, landing, and returning.

The critical problem in attaining velocities of hundreds of thousands of miles per hour is the containment of temperatures comparable to those in the interior of stars. Because the temperature of the driving reaction will have to rise as the square of the exhaust velocity, temperatures greater than one million degrees will be encountered in reaction chambers. Magnetohydrodynamics offers a unique solution to the basic problem of containing the reaction without contact with the chamber walls.

Briefly, the physical principles of magnetohydrodynamics are these. Since gas at such temperatures is completely ionized and is an effective conductor of electricity, the introduction of currents in the gas (in this state called a plasma) creates an electromagnetic field. This field makes it possible to control the plasma by applying an external opposing magnetic field which creates a magnetic bottle to contain the charged gas particles. Similarly, a magnetic-field piston can be used to accelerate the particles. Such magnetohydrodynamic reactions are expected to develop exhaust velocities that are an order of magnitude greater than those generated by present chemical rockets.

At Space Technology Laboratories, both analytical and laboratory work are proceeding in the field of magnetohydrodynamics. This work illustrates the advanced research in STL's Physical Research Laboratory, which emphasizes the application of basic physical principles to the requirements of space technology.

In support of its over-all systems engineering responsibility for the Air Force Ballistic Missile programs, and in anticipation of future system requirements, STL is engaged in a wide variety of research and experimental development activity. Projects are in progress in electronics, aerodynamics, propulsion, and structures.

The scope of work at Space Technology Laboratories requires a staff of unusual technical breadth and competence. Inquiries regarding the many opportunities on the Technical Staff are invited.

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great influence on the choice of sealing materials. Smoothness to reduce hot spots can be maintained with 250° to 350°F. Development work on silicone rubber should allow approximately 750°F for fillets and faying surfaces. Inorganic materials may permit over 1000°F for use. Sealant temperature capacities require further investigation.

Hydraulic Fluids

Development of hydrogenated aromatic mineral oil or methyl phenol silicones may extend the current 350°F limit for silicone base fluids. Where hydraulic fluids are a limitation, other types of mechanisms can be devised.

Bearings and Lubricants

Targets for the next five-year period will probably be 300 to 450°F for sliding friction applications and 750 to 1000°F for antifriction bearings. High-temperature greases of improved lithium soap base with aryl urea thickener are currently being evaluated. Development may extend this to 1000°F.

Bearings and lubrication for movable control surfaces which can withstand 2000°F are desirable. In the folding wing-tip area, use of boron nitride to prevent freezing, and air-pressure blown into a ball and race during movement, may be feasible. Other approaches may be fabrication of high-temperature bearings of hot-pressed synthetic mica impregnated with boron nitride or some type of cermet.

Electrical and Thermal Insulation

Electrical insulations of organic types are limited to lower temperature applications. Fibrous ceramic thermal insulation may prove usable to 3000-to-3200°F with acceptable reductions in properties. Various emissive and reflective coatings become effective above 1200°F. Ceramic honeycomb sandwich may have good thermal insulating properties, but requires further development.

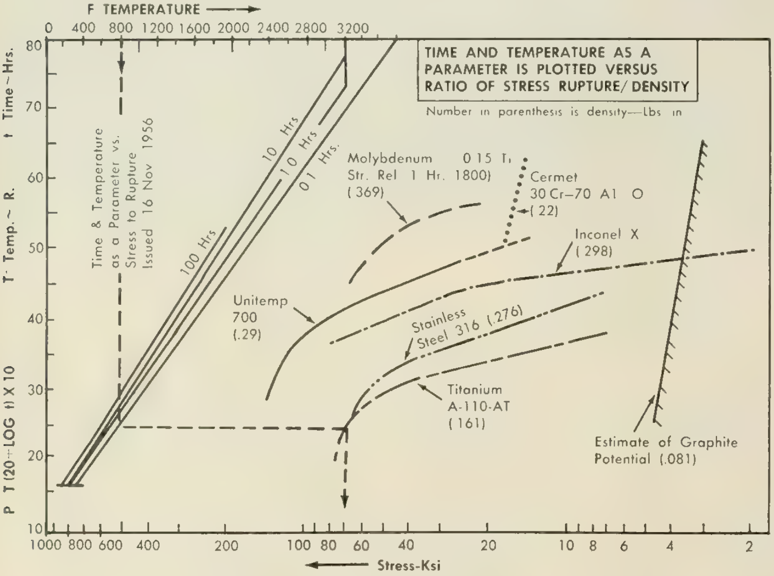

Fig. 7—Master material stress-rupture curve.

Metal	Elastic Modulus psi x 10^6 R.T.	Linear Expansion Coef./°F R.T. (70°F)	Thermal Conductivity cal/cm²/cm/°C per sec, R.T.	Specific Heat cal/g/°C R.T.
Tungsten (W)	50	2.2	0.399	0.032
Rhenium (Re)	.	. .	. .	0.033
Tantalum (Ta)	27	2.5	0.130	0.036
Osmium (Os)	80	2.8	. .	0.031
Molybdenum (Mo)	42	2.7	0.35	0.063
Ruthenium (Ru)	60	5.0	. .	0.057
Iridium (Ir)	75	3.8	0.14	0.031
Niobium (Columbium Cb)	42	4.0	. .	0.065
Hafnium (Hf)	20	3.4	. .	0.035
Rhodium (Rh)	42-55	4.6	0.21	0.059
Chromium (Cr)	36-42	3.4	0.16	0.11
Zirconium (Zr)	14	2.8-3.6	. .	0.066
Thorium (Th)	10	. .	. .	0.034
Platinum (Pt)	21	4.9	0.17	0.031
Vanadium (V)	20	4.8	0.38	0.120
Titanium (Ti)	16.8	4.7	0.130	0.126

Fig. 8—Temperature properties of refractory metals.

Coatings

Aluminum silicone paints provide oxidation resistance for metals to approximately 1200°F in still air, and about 900°F in Mach 0.8 air. Vitreous ceramic coatings will protect stainless steel 321 from oxidation for several hours at 2200°F or for 150 to 300 hours at 1600°F.

Molybdenum has been protected for several hours in still air at temperatures to 2800°F and for over 300 hours at 1800°F. Protection can be provided by several metallic and ceramic materials or a composite of layers of different materials.

It is felt that the conditions used in evaluating the above coatings may not adequately represent rocket environments. This subject requires further consideration.

Another important design factor is the ratio of tensile strength to density versus temperature for various materials. Generally speaking, an increase in weight becomes necessary due to higher temperature environments.

Udimet 500 and Inconel X are the most efficient in the 1000° to 2000°F range, but exhibit an extreme sensitivity in strength with small temperature changes. The strength of Udimet 500 at 1500°F decreases 50 per cent at 1700°F.

Inconel has a strength at 1700°F which is 70 per cent of its 1500°F strength. Thus, a 200°F temperature design error (which is a 10 per cent error on the absolute temperature scale and is acceptable engineering accuracy considering the present state of temperature prediction techniques) has a drastic effect. This means that the less efficient material, molybdenum, is favored for use at 1500°F when the sensitivity to temperature is given heavy emphasis.

Fig. 4 is a comparison of several standard structural properties; that is, impact strength and thermal properties. Most of the metals have acceptable impact resistance. The cermets and ceramics have poor impact strength and the strength indicated on the bar graph may be somewhere of the order of 10 times less than indicated here.

Efforts directed toward increasing cermet impact resistance by cladding or infiltration techniques have given some increase in strength, but a major breakthrough in strength has not yet been achieved.

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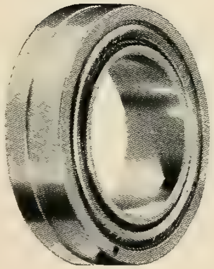

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It is not known if basic work on composition, dispersion of nonmetallics in metallic phase, particle size and shape will be the answer. This condition places increased emphasis on the refractory metals.

The thermal superiority of molybdenum is due to a combination of high thermal conductivity and low thermal expansion, with a conventional specific heat. This combination is desirable in areas of high heating rates, high temperatures, and high thermal stresses.

As a vehicle's heat sink capacity is exhausted during flight, the heating rates decrease. Molybdenum would decrease in thermal conductivity with resultant reduction in heat conduction and cooling requirements, but at the cost of higher skin temperatures.

High Melting Point Metals

Molybdenum, tantalum, tungsten, and columbium (niobium) are the most feasible metals for development as elevated temperature structural materials on the basis of melting point, availability, price and vapor pressure.

The significance of melting point, availability, and price in determining feasibility is more readily apparent than is vapor pressure. The effect of vapor pressure is shown in the following table (from HIGH TEMPERATURE TECHNOLOGY by I. E. Campbell, Wiley & Sons, 1956):

Metal	1% Vaporization per 100 hours Temp. °F	Melting Point Temp. °F
Tungsten	4640	6150
Tantalum	4350	5425
Rhenium	4315	5750
Niobium (Columbium)	4045	4380
Osmium	3830	4890
Iridium	3615	4450
Molybdenum	3470	4760
Ruthenium	3450	4530
Rhodium	3040	3625
Platinum	2910	3225
Zirconium	2730	3325
Vanadium	2625	3155
Titanium	2030	3140
Chromium	1645	3435

Not much published information is available regarding properties of binary and more complex alloys of Mo, Ta, W and Cb, and those involving small amounts of the platinum group (osmium, ruthenium, iridium, rhodium). Apparently these are being investigated by people like Battelle who believe that in this area developments may lead toward practical metallic materials for high-temperature service.

Density at about 1700°F, the strength-to-weight ratio of molybdenum plus 0.5 per cent Ti becomes increasingly superior with increased temperature when compared to such materials as cermets and superalloys. Additions of small amounts of Cb, Co, Zr, and V to molybdenum are under investigation at Climax Molybdenum.

Areas of high-temperature materials for future investigation are: (1) cermet evaluation; (2) composite structures; (3) development of new and unknown high-temperature compounds; (4) corrosion protection (Convair work includes study of ceramic-coated aluminum mild steel, stainless steel and titanium); (5) structural uses of cermets and reinforced ceramics (including ductile ceramics); (6) high-temperature adhesives (ceramic bonded aluminum and stainless lap shear joints are being developed); (7) erosion protection (flame-sprayed ceramics are being investigated); (8) thermal and radiation reflectivity at elevated temperatures; and (9) thermal insulation.

Miscellaneous applications are: (1) rocket nozzles and combustion liners; (2) high-temperature bushings, gaskets and shroud rings; (3) internal pump parts for handling molten materials; and (4) electric insulators, dielectric materials and separators in vacuum tubes.★

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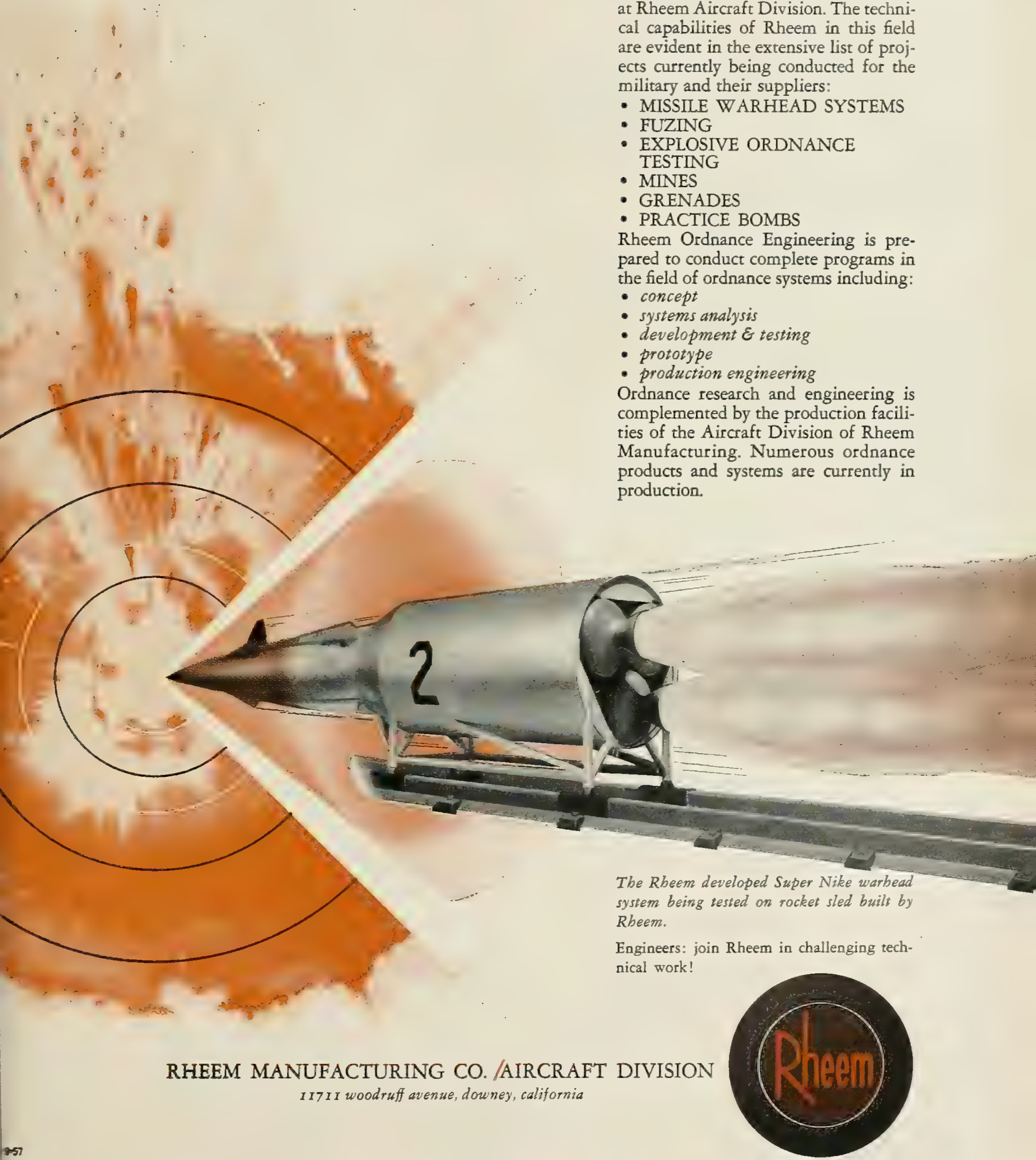

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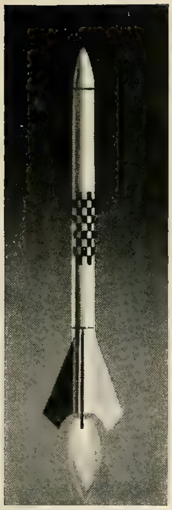

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a new missile material . . .

Welded Stainless Steel Hollow Core

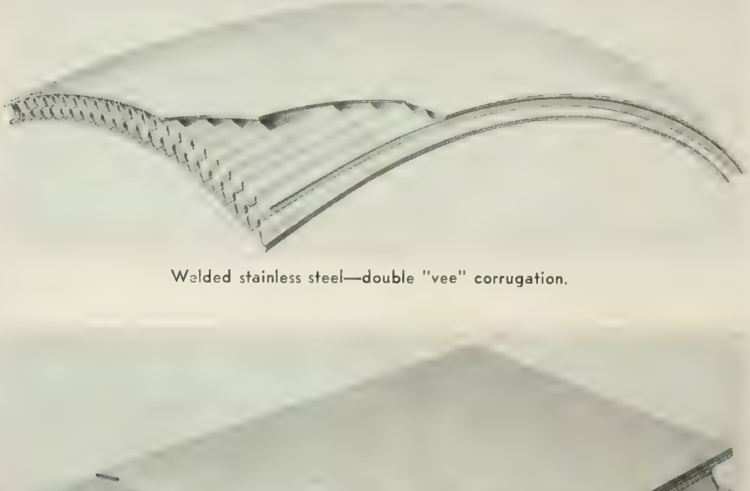
by Dr. Michael Watter

MISSILE AND aircraft structures, although they represent only a part of the weapon system, play a vital role in the performance of the whole system and confront the designers with many new problems. The task confronting the industry is twofold:

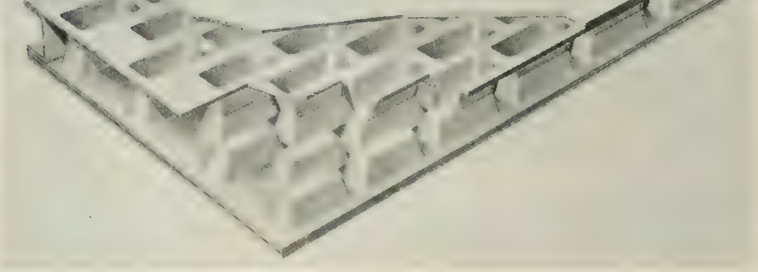
One is to create the most advanced weapons compatible with just enough of the extrapolation of known means as to be able to reduce the time between design and its experimental realization; second, to push aggressively research of all phases necessary to assure maximum future weapon potential if there be time to take advantage of it.

Because of their novel features, this article stresses the subject of integrated core structures and is limited to a few typical examples designed and built to meet specific requirements. They emphasize the fact that each structure must be patterned to suit the specific loading and environment conditions of the design problem.

Budd integrated core structures utilize several basic types of integrated core sandwich panels. One type employs a double "vee" corrugated core, while in another type the core is of a stamped type made of two pieces. In both cases the core sheets are welded together on the neutral axis and then, in turn, to each face sheet.



Welded stainless steel—double "vee" corrugation.



Welded stainless steel—double elongated waffle panel.

Still another type employs a single "vee" core welded between two face sheets. The specific dimensions of the panels, gauges of the core and face sheets, as well as the material used, are selected to meet best the engineering requirements of the problem. The materials are those satisfying the temperature and design requirements and suitable for resistance welding.

The significance of resistance-welded structures lies in several well-established but not generally known factors. For instance, because spot welding causes local reduction in the tensile strength of the weld nugget, it is sometimes thought that this local reduction limits the strength of the structure.

Actually, however, a lap joint with a double line of welds, made either of cold-rolled or heat-treated-prior-to-welding material, may have an efficiency in tension of over 95 per cent. With a small amount of additional material, tension joints can approach 100 per cent efficiency.

The development and present availability of the extra hard 301 stainless steel with its high physical properties, as well as the utility of increasing the strength of heat treatable alloys by subsequent cold reduction, stems from their ability to utilize effectively high strength in resistance-welded structures.

In addition to the 301-type stainless steel, the same high-strength properties can be obtained in 201-type as well as austenitic stainless alloys which do not contain nickel, such as Tenelon and TRC.

The geometry of the integrated

Dr. Watter is Director, Airframe Research Defense Div., The Budd Co.

core makes it possible to fabricate structures of exceptional efficiency from either cold-rolled, or heat-treated and subsequently cold-rolled alloys supplied directly by the mills with their highest physical properties.

Structures of the integrated core type can be fabricated as cylinders, cones or as surfaces of compound curvature which make them eminently suitable for rocket motor and missile structures. The directional characteristics of the single and double "vee" type of sandwich prove to be significantly advantageous in a number of missile structures because the core is a load-carrying member in addition to its contribution to the rigidity of the panel.

Because of the nature of the manufacturing method, missile shells, rocket motor casings, bulkheads and other missile structures are not limited in size, disposition of the internal or external structure, or the location of fittings. Their dimensional accuracy is assured by progressive fabrication permitting corrective adjustments without encountering problems normally present in heat treating large and usually considerably less rigid assemblies.

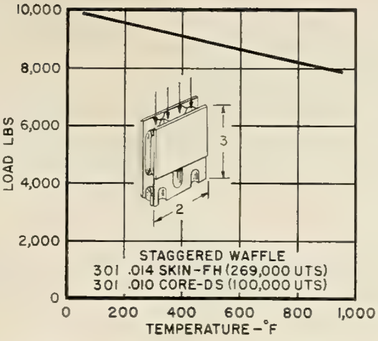
In the course of design experience, it has been found that these structures are very effective in a wide range of applications. For instance, they can be proportioned to have either low thermal conductivity or, when needed to minimize thermal buckling, a rather high thermal conductivity without sacrifice of their structural efficiency. They are also eminently suited for situations which would require cooling.

The availability of 301 stainless steel with an ultimate strength of 300,000 psi and the effectiveness of resistance-welding techniques of assembly have resulted in appreciable gains in structural efficiency in several applications which did not require resort to a sandwich construction. In other instances where high-temperature conditions were present, other alloys such as A-286 and L-605 were employed with satisfactory results.

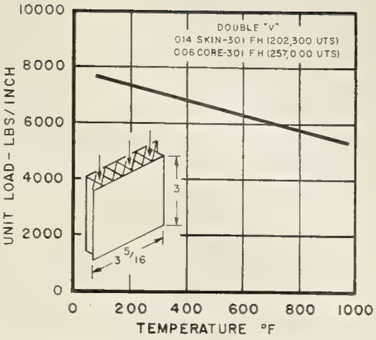
Airframe and missile structures confront the designer with two—or a combination of two—basic problems. In the case of airframes, the problems predominantly fall in the class customarily called elastic stability, while in the case of missiles they also often involve problems of tensile strength.

As stated, many of the materials potentially important in missile and airframe structures can have their physical properties enhanced through cold working, irrespective whether these materials fall into the category of heat-treatable alloys or alloys whose high physical properties can be obtained only through cold working.

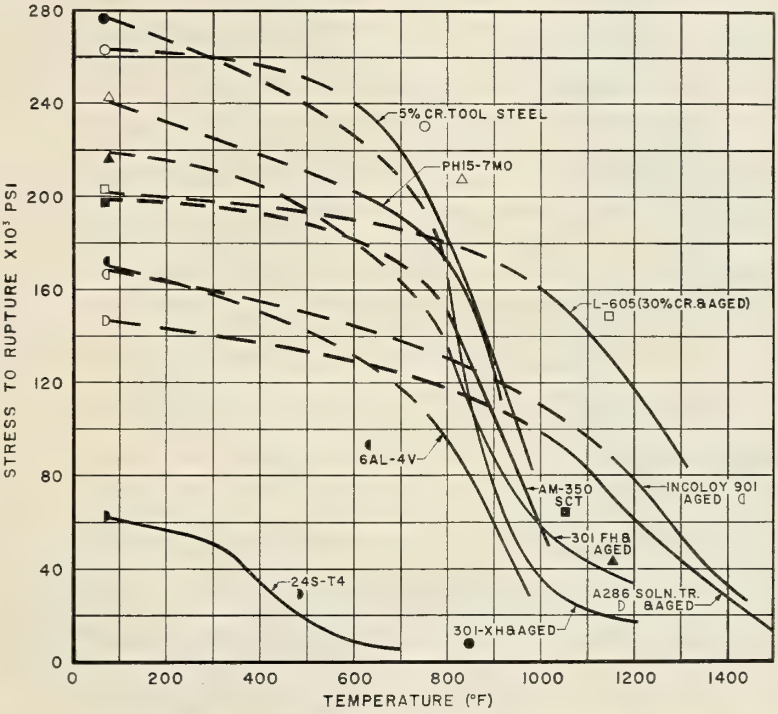
These cold-reduced materials



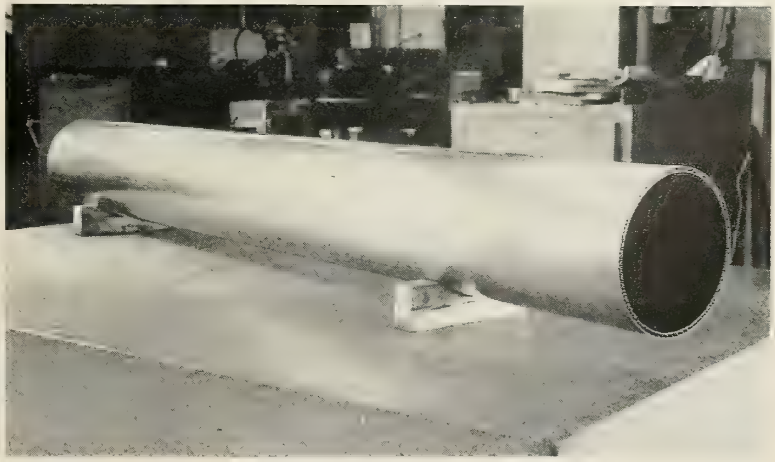
Double waffle compression load curve.



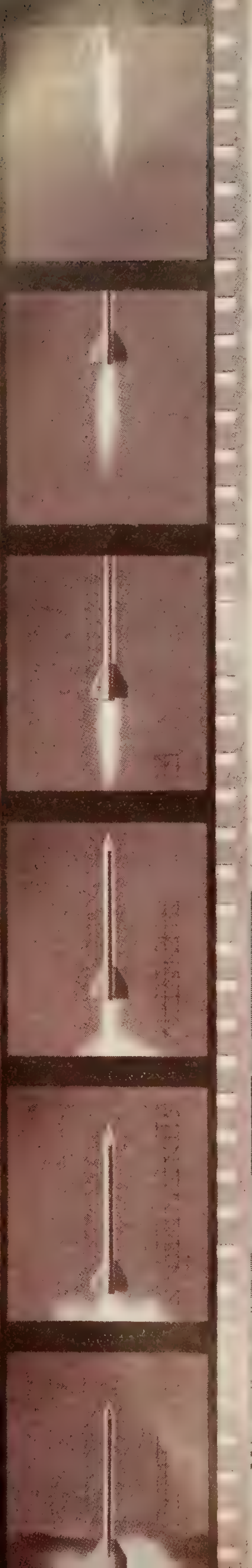
Double "vee" compression load curve.



Stress-to-rupture curves of various materials that can be resistance-welded.



Single "vee" resistance-welded stainless-steel hollow-core tube may have rocket uses.



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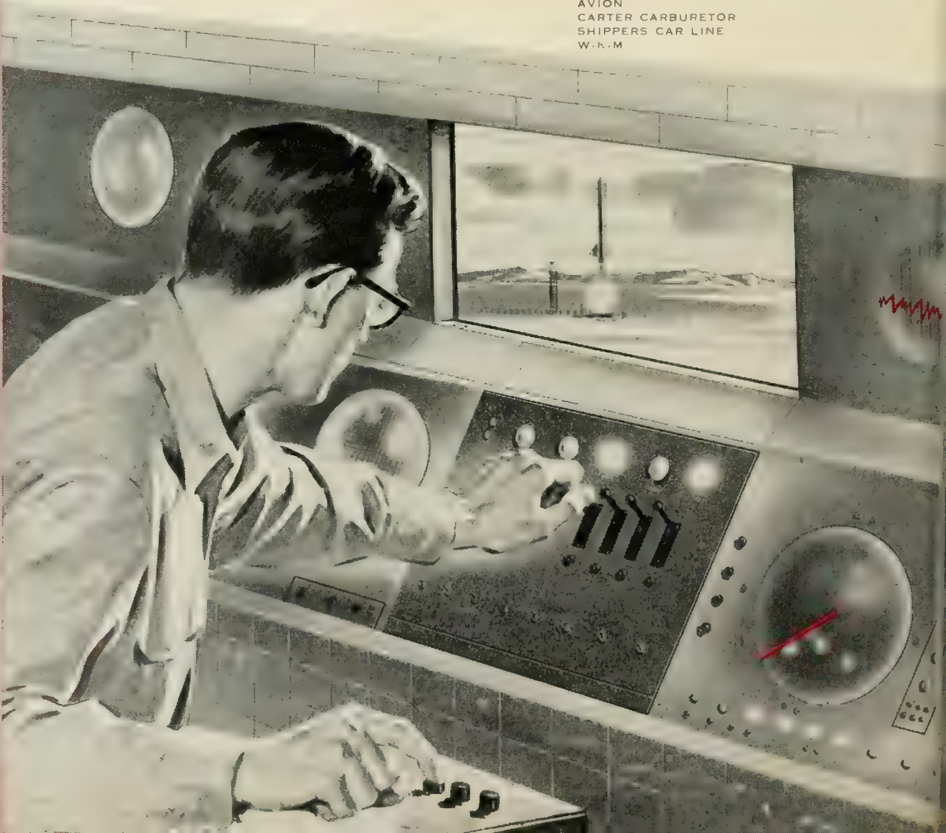


often possess highly anisotropic properties. In addition, many composite structural elements do not or need not display isotropic behavior. The treatment of anisotropic plates is found in a number of classical texts familiar to structural engineers and requires no further discussion. The subject of anisotropic materials, however, has not been widely treated.

The necessity of analyzing structures to be made in 301 stainless steel offered another useful discipline, since classical elastic behavior is not the virtue of the material. It thus became necessary to consider the true behavior of the material which was done by applying the usual methods of inelastic behavior, *i.e.*, behavior displayed by materials in the region beyond proportional limit.

To simplify routine calculations it is useful to prepare a series of effective curves for buckling, crippling, bending and shearing. In this instance, buckling is defined as a recoverable deformation while crippling denotes a permanent failure. In treating the subject of buckling of anisotropic materials, this author combined the inelastic behavior beyond proportional limit with the treatment of buckling of plates reinforced by ribs. The sufficiency of this approach for engineering analyses has since been supported by Bureau of Standards tests, the author's company's experience, and independent tests.

In the problems of missile shell design one often encounters the problem of tension, which may appear to offer no chance to apply design and analytical skill. Actually, this is not necessarily the case. The structure is always more complex than a simple tensile test coupon and hence there are problems of making joints, providing local attachments and assuring maximum rigidity of the shell particularly when fabricated in very large sizes.

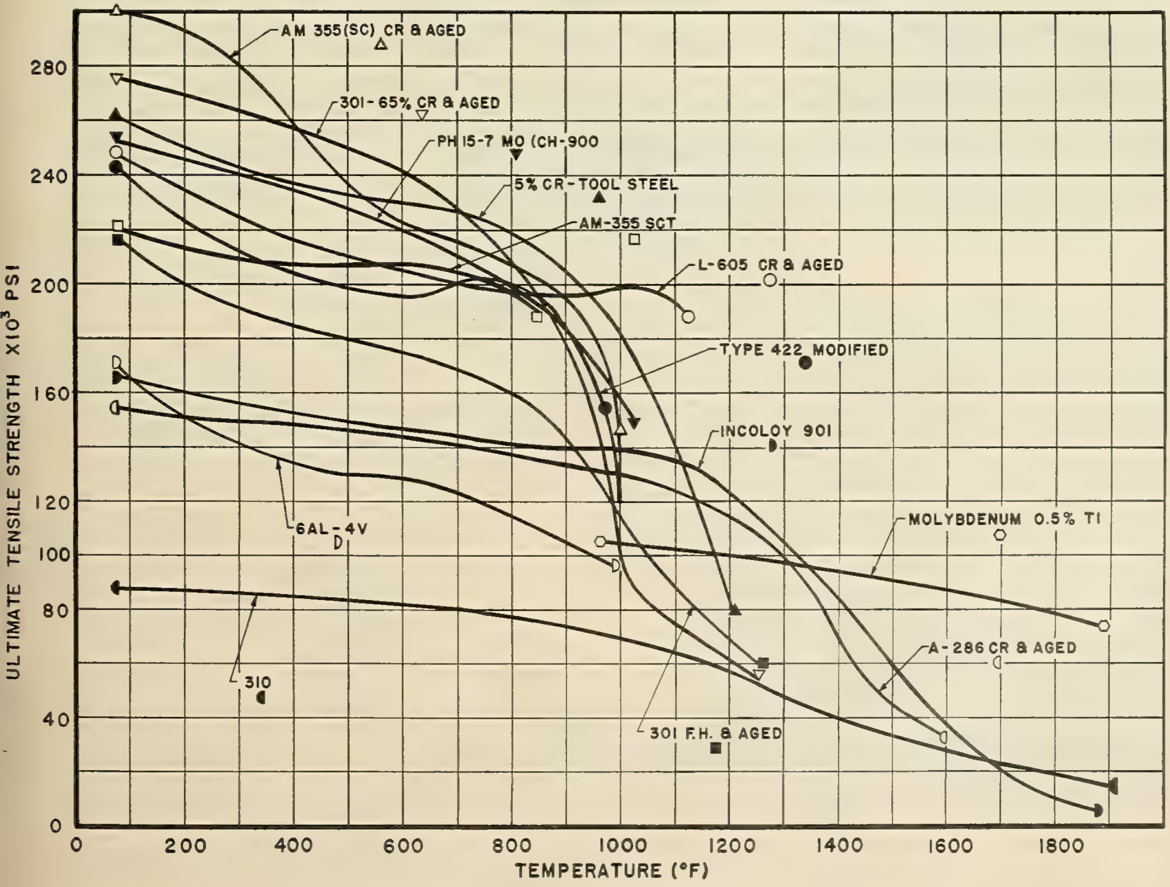
Competent proportioning of the structure can, however, assure only its theoretical correctness. Since resistance-welded design differs radically from either brazed or mechanically fastened design, the sequence of assembly must be well thought out and established by the designer in cooperation with tool engineers; it must take cognizance of the fabricating techniques and welding tools.

Welding limitations, although very much fewer than generally thought, do exist, and incorrect sequence of assembly can prejudice both the structure and the ability to fabricate it.

The problem of designing resistance-welded structures subject to fatigue is not different from that involved in any other structure, except that it requires specific experience. In one aircraft company, there was a sign across the drafting room which said "Don't forget the fillets!"

All structures must guard against "stress raisers" but where to look for them and how to cope with them is a matter of good judgment and accumulated knowledge.

Resistance welding has been and is used successfully in many structures subject to severe vibrations. It has been used for aircraft fuel and oil tanks; it is extensively used in jet engines, afterburners and other locations having drastic service requirements. It can assure pressure tightness, fuel tightness, ability to withstand sonic vibrations,



Ultimate tensile strength of various materials plotted against temperature.

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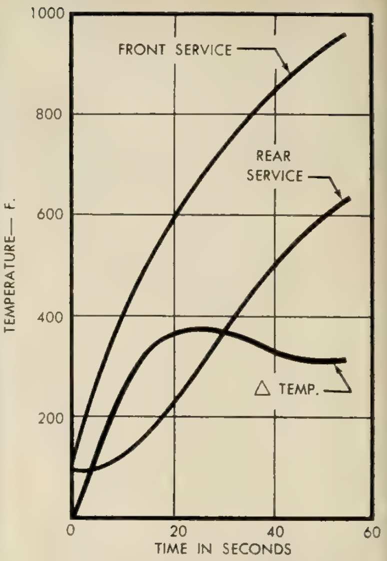

Heat transfer rate through stainless-steel hollow core, showing total differential.

but one must provide a correct design and use suitable materials.

To expect that it can be used under all circumstances is unreasonable. Under certain conditions, considering the design limitations and service requirements, competent designers will not attempt to use resistance-welded structures—in many other cases only service or well-conceived simulated tests can establish what type of structure will meet the requirements.

Properly designed resistance-welded structures display a very favorable fail safe behavior. It limits crack propagation and having failed under excessive loading, in bending or compression, most of the time can still support a major percentage of the load which caused failure. The speed brake, referred to above, after having failed at 130 percent of ultimate load, supported about 70 percent (almost the limit load) without further distress.

Materials

In order to view the materials in the light of their possible application to actual structures, they must be considered not just on the basis of their physical properties, but on the available means of joining and forming.

Materials which derive their high physical properties at room and elevated temperatures only through cold reduction, such as 301, L-605, and A-286, can be joined advantageously only by resistance welding in this condition.

To proportion the structure in a given material, complete information must be available in the form of stress-

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strain curves which, in the case of cold-rolled materials, must include longitudinal and transverse curves both for tension and compression. Customary physical data must be consulted.

The significance of these data must be weighed not only in the abstract of test a coupon, but as a result of the material application in a specific structure. To illustrate this point one may consider the stress-strain behavior of some cold-rolled materials. These materials often exhibit a very low proportional limit which may lead the designer to fear a high cumulative permanent set of his structure.

Tests prove, however, that complete structures, properly designed, approach the ideal of Hooke's law throughout the working range of the structure. A rational explanation for this lies in the fact that, unlike a test coupon, in a complex structure under a given condition of loading only a few fibers of a few members are under maximum loading. Once this loading is taken off, the elastic energy of the complex structure plays its part in the recovery of the structure to its original state. It would appear to this author that a designer may justifiably hope that the strain temperature behavior may not prove as much of a problem as it would appear to be on the strength of data currently available from test coupons.

Budd's long experience in the fabrication of resistance-welded structures served as a valuable guide in the selected approach to fabricate Budd integrated core panels. It was decided that the important feature was to adopt a method which would allow the fabrication of panels not limited either in size, gauges or compound curvatures and, in addition, suitable to permit assembly of these panels into a complete structure with the necessary attaching members and fittings.

One of the fundamental problems in any structure is, of course, the technique of joining and the reliability of joints. Resistance welding has its specific problems which must be recognized and understood.

Just as in the design of resistance-welded structures one must adopt a special approach, so in their fabrication there must be employed ample safeguards and controls.

Having originated the first controlled method of resistance welding of stainless steel known as the "Shot-Weld" process, The Budd Co. early in its experience recognized the importance of proper methods, equipment and instrumentation required to assure safe and economic resistance welding.

Missile and aircraft structures accentuate the requirements necessary to assure reliable and consistent welded joints as well as dimensional accuracy with aerodynamic smoothness. (At this point it would be pertinent to interject that The Budd Co. resistance-welded panels have met known airframe and missile finish specifications.)

In addition to the techniques and safeguards of welding control familiar to the aircraft and missile industry, there are two additional quality control methods under development. One of these consists in the use of an entirely novel automatic weld controller. This device—and there are two types under development at the present time—controls the essential variables, namely current and time, to assure the weld of a required size and strength. It is able automatically to adjust these variables for different thicknesses. It is equipped with an automatic lockout so that, if the local conditions preclude making the required weld, the welding is discontinued and a warning signal is flashed to the operator.

The second method under development makes it possible to determine on the surface of the finished part the size of the weld nuggets as well as of the heat-affected zone and to obtain a permanent record without resort either to photography or X-ray.

This method shows considerable promise; the correlation between macro-etch and shear-test data and the information supplied by Perma-Weld, as this method has been named, has been encouraging.

In addition to these two methods of quality control, a third technique being employed is simple and conclusive. It consists of internal pressure tests. This is a nondestructive positive test visibly demonstrating the integrity and the pressure-tightness of each panel.

It is well known that the aircraft industry, with notable exceptions, views resistance welding with considerable concern. This attitude is both proper and understandable. Some of it stems from past experience when resistance welding was applied to low density alloys of high electrical conductance and high tendency to oxidation. More recent experience with high density alloys, although directed to materials eminently suitable for resistance welding, has sometimes failed because the latest techniques and equipment were not employed.

Currently there are both prime contractors and subcontractors in aircraft industry who have the required competence in resistance welding and are doing an excellent job. It is their experience that should be used as a criterion in assessing the value of resistance welding as a safe and effective method of fabrication.★

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at last:

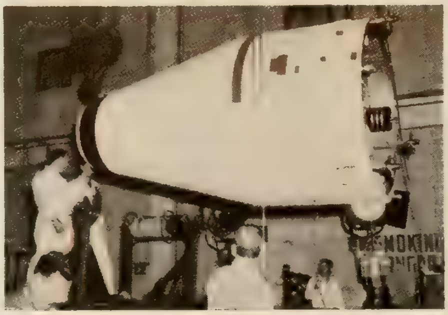
U.S. Satellite Aloft

by Norman L. Baker

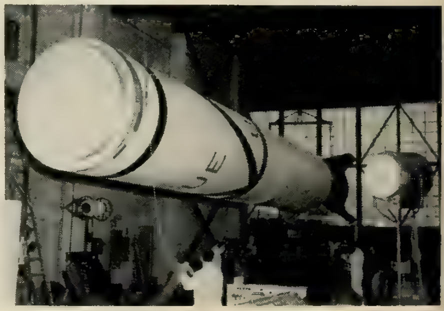
TEN FIFTY-EIGHT PM January 31, 1958—the date the United States officially entered space. Just as dramatic as the actual launching of the *Explorer* satellite was the conclusive proof that the early decision to divorce space research from military missiles was a very unwise decision indeed.

The launching climaxed almost four years of frustrated efforts by the Army to prove its rocket abilities and give the United States the lead in the race to space. It is now official that an *Explorer*, weighing approximately five pounds, could have started orbiting the earth on Sept. 20, 1956, when a four-stage *Jupiter*-C re-entry test vehicle flew 3300 miles over the Atlantic range. The last-stage rocket and satellite were replaced by dummies on direct orders from the Pentagon to prevent the Army from making an unauthorized satellite launching. Just 27 days from the official authorization and 86 days from the undocumented nod from Defense Secretary Neil McElroy, the Army's determination paid off.

Explorer II is on the pad at Cape Canaveral. Launching date: before April 1. The Army's role in the satellite field after *Explorer* II is highly speculative. Once again they must pool their proposed projects with those of the Navy and the Air Force and hope that the people who make the selection do not repeat the mistake of 1954, when the *Vanguard* was chosen over Project *Orbiter*.★



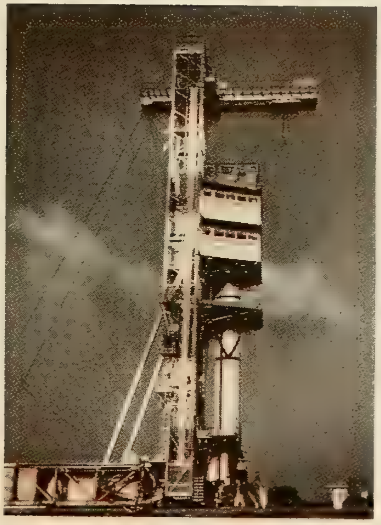
Control section of the EXPLORER launching rocket. This section positioned final stages to satellite launching attitude shortly after separation from first stage.



Modified REDSTONE first stage is prepared for checkout in the assembly hangar at launch site. Using a hydrazine-based fuel, booster lifted the satellite to approximately 56 miles above earth.

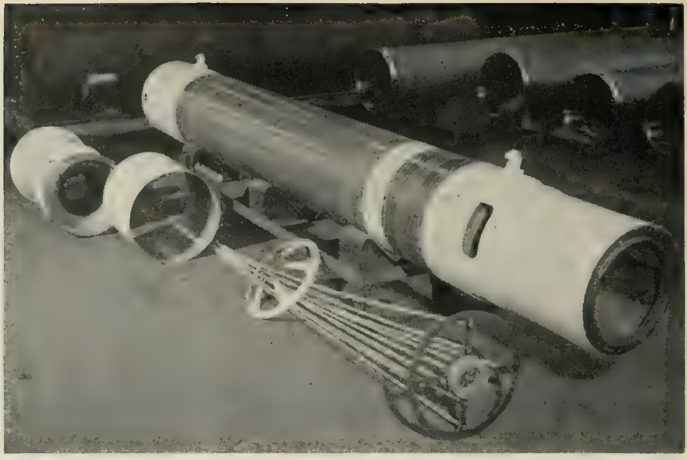
Sealed in polyethelyene to protect it from the elements, EXPLORER I is carried from instrumentation checkout trailer to gantry for mounting on fourth stage of the rocket configuration. Total electronic payload weight was approximately 11 pounds, total payload 17 pounds.

January 29th — Technicians check out the instrumentation and make final adjustments on the JUPITER-C's guidance and control in anticipation of an evening firing. High winds at upper altitudes forced postponement for 48 hours. Up to a few hours before launch the jetstream was reported to be producing blasts up to 200 mph.

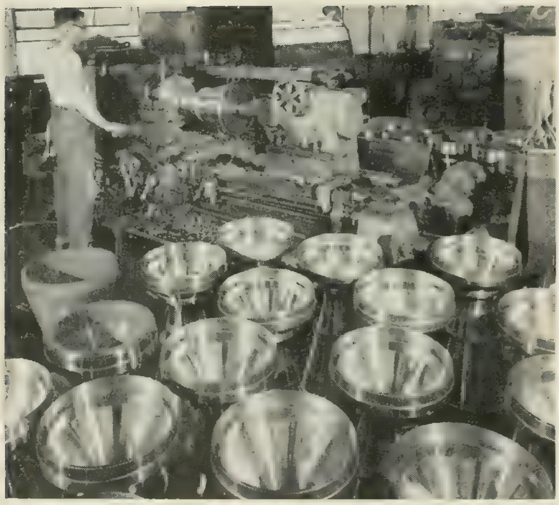


January 31st — With countdown for launching under way and proper weather conditions assured, last minute checkouts induced unwarranted tensions. Fuel spillage caused several minutes delay when leakage was suspected. At countdown "zero" missile pressurization was started. Ignition started at X plus 14 seconds. The rocket took off at 15.75 seconds after "zero."

Case for GOODYEAR



A plastic-impregnated, fiberglass NIKE rocket, manufactured by Goodyear while investigating better ways to make the boosters.



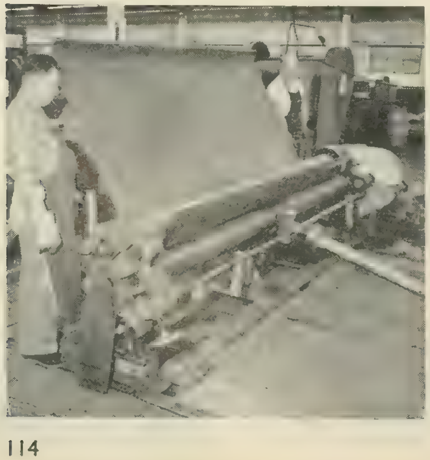
The nozzles are received from the foundry as rough forgings and machined to final shape to maintain the tolerances needed.

GOODYEAR AIRCRAFT'S rocket activities have produced more large rocket motor cases than any other manufacturer. In order to achieve this standing in the industry the company entered the business in 1948 with an extensive development program for an engine case that could be produced economically in quantity. The success of that development program is depicted in accompanying photos of the company's current production facilities.

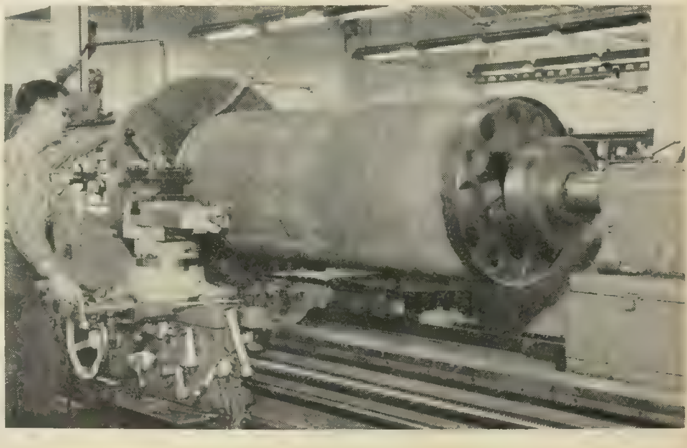
Starting with Jato bottles, Goodyear soon expanded its facilities to produce a large number of units a month for the Army's *Nike-Ajax* missile. *Nike* booster cases are still the chief production item in an expanded program, but the company has built or is building rocket motor cases for the *Nike-Hercules, Matador, Genie, Hawk, Recruit* and other missiles.

Although past and current production has been largely cases made of special steel, extensive investigations have been made into the use of aluminum, fiberglass, magnesium and plastics.★

Steel sheets are rolled into tubes as the first step. Later, tubes are longitudinally welded.



After the longitudinal welding operation is completed, the rough cases are mounted in a lathe and accurately cut to the required length.



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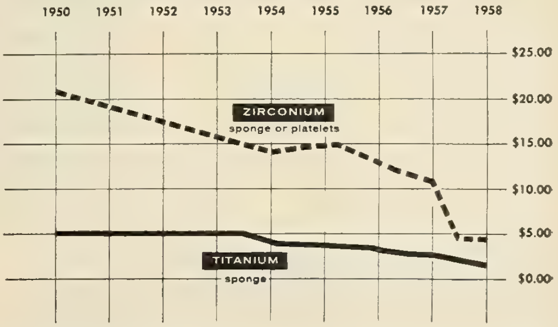

Regular price reductions in titanium and zirconium sponge have also been reflected in lower prices for mill products. This trend shows the wisdom of evaluating titanium and zirconium now for your new products.

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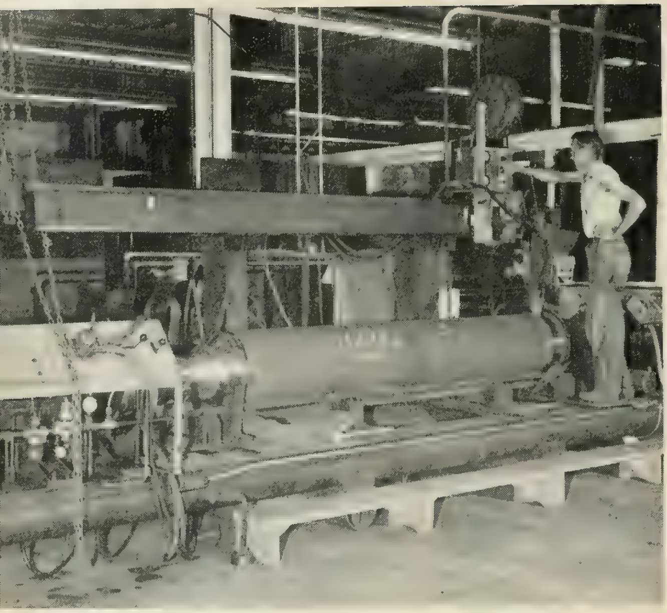
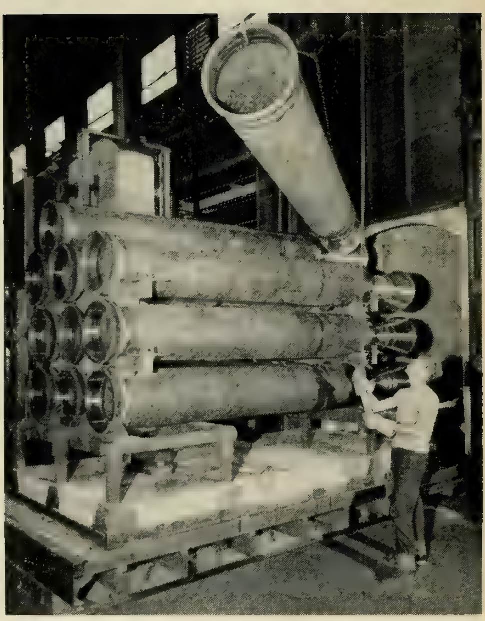
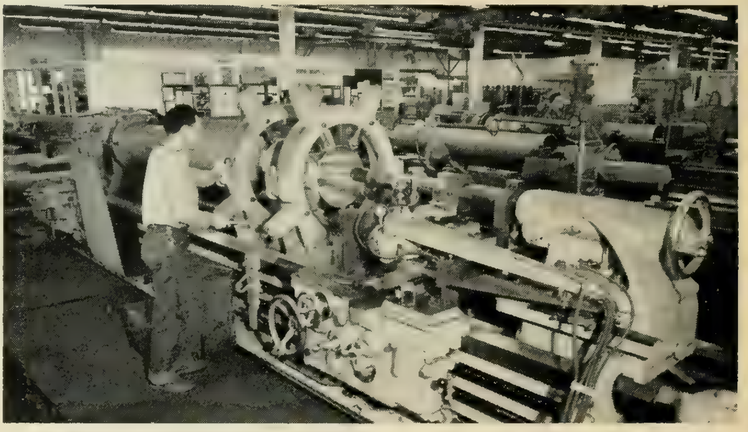


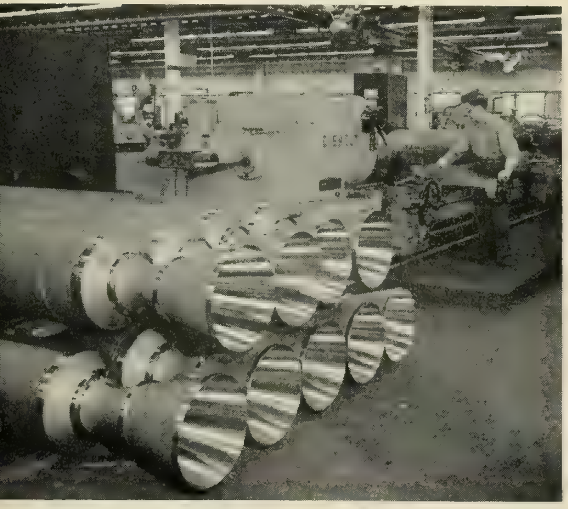


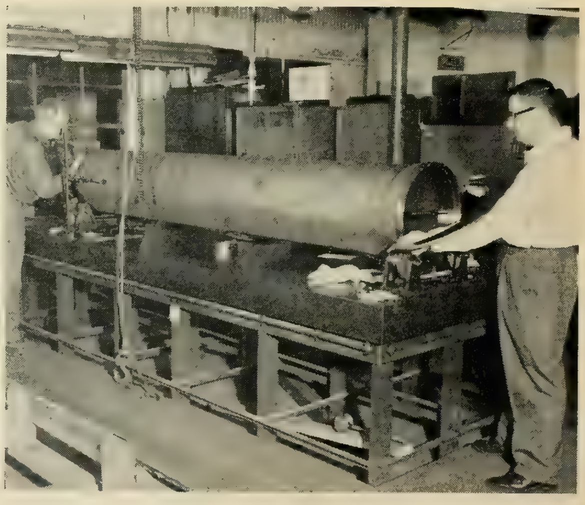
In an assembly fixture, the three principal parts of the motor—nozzle, tube, and forward ring—are welded into a single unit (Above).

Stresses produced by the welding operations are then relieved in a furnace (Above right). To correct any misalignment which may have been caused by welding or heat-treating steps, rockets are given final thrust alignment cuts on a tracer lathe (Right) plus final alignment for fin attachment rings. Rocket motors which have been through operation show bright rings around nozzle (Below).

After machining, inspectors check inside and outside dimensions carefully and alignment of nozzle to case. Past inspection, the rockets are cleaned, bonderized and painted (Below, right).







EEMCO ANNOUNCES

. . . a new electro-mechanical actuator to drive airborne cargo bin conveyor systems

EEMCO electro-mechanical rotary actuator Type D-961 has been developed for use on airplanes to drive their baggage bin conveyor systems. Operated either electrically or manually, the actuator moves the bins forward or aft, and holds the bins in any desired place.

This new **EEMCO** rotary actuator consists of an intermittent duty 200 volt, 3-phase, 400 cycle AC motor and gear box. It is electrically reversible and includes an AC operated brake, thermal overload protection, manual drive input shaft, and reverse torque lock mechanisms.

The unit is designed for normal operating load of 810 in. lbs. torque at 16 rpm, 1.4 amps, and meets all pertinent military specifications. The maximum static load without permanent deformation is 5100 in. lbs.

EEMCO specializes in the design and production of precision-built actuators and motors. The majority of the latest and fastest aircraft and missiles carry one or more **EEMCO** systems. Prime contractors of civil and military aircraft rely on **EEMCO's** years of experience in the exclusive design and production of motors, linear and rotary actuators.

SPECIFICATIONS FOR TYPE D-961

Motor:
200-volt, 3-phase, 400-cycle
AC motor with gear box.

Normal operating load:
810 in. lbs. torque
at 16 rpm, 1.4 amps.

Maximum static load:
5100 in. lbs.

Weight:
12 pounds.

Qualification:
Type D-961 has been designed and qualified to meet applicable military and aircraft manufacturers' specifications.

Your inquiry is invited.

EEMCO ELECTRICAL ENGINEERING & MANUFACTURING CORP.
4612 West Jefferson Boulevard, Los Angeles 16, California • Telephone REpublic 3-0151
DESIGNERS AND PRODUCERS OF MOTORS, LINEAR AND ROTARY ACTUATORS . . . EXCLUSIVELY!

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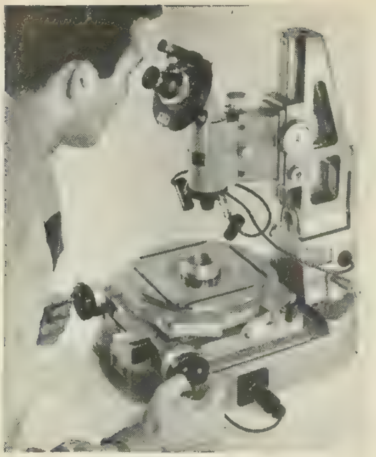

Gaertner Toolmakers' Microscope used to measure typical piece part. Co-ordinate range 4" x 2".

Precise measurement to 0.0001" and 1 min. of arc

Gaertner Toolmakers' Microscope

Here is a reliable, easy-to-use microscope for precise measurement of piece parts, tools, dies, thread gages, templates, jigs, fixtures, etc. Ideally suited for making a wide variety of precision measurements and is especially valuable in reducing rejects in production work.

With the Gaertner Toolmakers' Microscope you make direct, non-destructive measurements — no contact, no distortion, images are sharp and clear. It is a basic measuring instrument for inspection depts., gage labs, tool and die and model shops, industrial and research labs.

The Gaertner Toolmakers' Microscope has been proven in use by U. S. Government Gage Laboratories, and by prime contractors and their subcontractors. With all parties using the same measuring instrument, inspection procedures are co-ordinated and disagreements and rejects minimized.

Features that help you get
HIGH SETTING AND REPEATING ACCURACY

- Low, compact built-in rotary stage reads to 1 minute of arc throughout 360° range.
- Minimum overhang of stages.
- Full 2" precision-lapped lead screws with correction device.
- Straightforward, direct, uncomplicated optical system.

Features that assure you of
EASY, CONVENIENT OPERATION

- Independently rotatable cross hairs in protractor ocular speed up measurements, simplify measuring procedure.
- Convenient location of ocular eyepieces for ease of reading.
- Built-in transformer and plugs for all illuminators.

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MEET YOUR EXACT REQUIREMENTS

- Thread and radius templates, camera and spotting attachments, fine motion focus, variable magnification available.
- If you have a special measuring problem, our staff of representatives will be happy to consult with you. The service and engineering facilities of the manufacturer are always immediately available to help you.

Write for Bulletin 147-56
Designed and manufactured by
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1258 Wrightwood Ave., Chicago 14, Ill.
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Silicone Applications in the Missile Industry

can polymeric silicon compounds solve today's critical problems?

by Norman L. Baker

ORGANIC COMPOUNDS of the earth's second most abundant element are utilized in many ways to help solve critical problems in the rocket and missile program. Applications range from oils, greases and plastics to heat-resistant lubricants, varnishes, binders and electronic insulators.

A major portion of the missile program is invested in the guidance systems operated and controlled by complex electronic devices. These nerve centers must function perfectly even after storage for extended periods in the humid tropics, in the frozen Arctic or on the salt-sprayed decks of boats or submarines. Silicone rubber and resin coatings, potting compounds and protective shields are providing the answer to these rigorous conditions.

Entire circuits are protected by coatings of silicone rubber. These are moistureproof, fungusproof and impervious to weathering or ozone attacks. These units may be exposed to a temperature range of from −70°F to several thousand degrees within seconds. Even if the silicone rubber covers on the wires and circuits do burn, continuity of the circuits and control of the missile are maintained because silicone rubber leaves a nonconducting silicone residue.

Gaskets, sealing rings and tubing must resist all of the above hazards, as well as function during brief exposure to concentrated peroxides, strong acids and various liquid fuels. These seals must function perfectly even after they have been opened and closed many times during the assembly, testing and preflight periods. Silicone rubber parts are the answer; specifically silicone rubber compounds with the vinyl-containing gums which provide the near ultimate in resistance to taking permanent set.

Silicone fluids with a very high viscosity go into several very ingenious mechanisms such as "grain immobilizers" to compensate for distortion due to temperature in mechanical linkages.

Radome Polyesters

In the structure of aircraft and missiles, silanes and silicones have found important areas of application. Radar transparent radomes are a necessity in all phases of aircraft and missile operation, and glass-fiber-reinforced polyesters are almost universally used for this work. Radar antennas on the ground, as part of the air defense system, are protected by such devices. The units for guiding aircraft and for aiming guns are also covered with radar transparent radomes. An essential ingredient of these products are the vinyl silanes which couple the resin to the glass, thereby increasing the strength and effectively eliminating most of the effects of water or high humidity on both electrical and mechanical properties.

Silicones today are used for the high-altitude, high-speed research rockets and missiles which are being used to secure weather and ballistics information, as well as those which are part of the antiaircraft and antimissile defense.

Guided missile weapons and many other free-flight devices which are electronically guided at very high speeds, as already mentioned, require

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RAYTHEON *MISSILE SYSTEMS DIVISION*

RAYTHEON MANUFACTURING COMPANY, Bedford, Mass.

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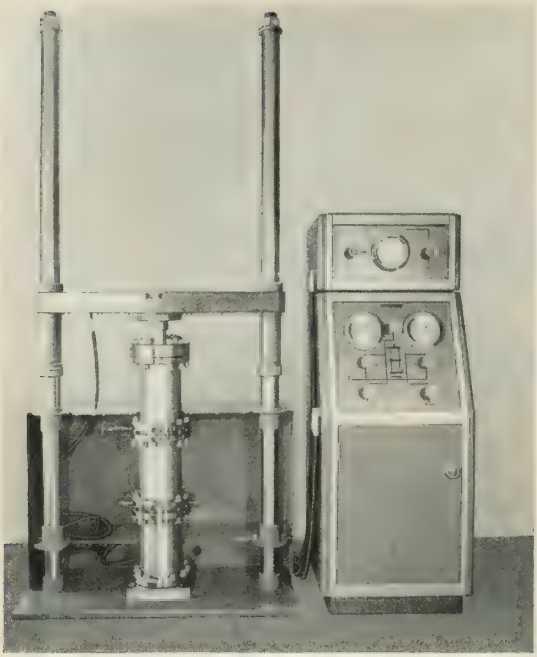


New shock tester—the HYGE-6000—available with 12″, 18″, and 37″ long cylinders.

NEW HYGE repeats shock patterns with 40,000 lbf. thrusts

Environmental shock testers now have a method of releasing as much as 40,000 lbf. of stored energy to produce predictable, reliable, and repeatable shock wave patterns.

The new six-inch Hyge produces square, sawtooth, and half-sine patterns to test and set standards for aircraft, missile, turbine, and rocket components as well as other parts subjected to high-*g* acceleration and deceleration.

The procedure . . . You specify the shock wave form you want the Hyge to produce—any of those mentioned above, alone, or in possible combinations.

CEC engineers then calculate your factors of mass, time base, and acceleration level of shock pulse. They design and produce a metering pin which controls the action of the Hyge shock tester precisely.

Hyge tests can simulate almost exactly actual service conditions. The tests are exactly repeatable with very short time lags for set-ups. Unit tests cost only pennies.

Hyge is versatile, small, and requires little maintenance or skill on the part of the operator. The operator does *not* enter the tests as a variable.

Since the whole Hyge principle is relatively new, you'll want more information on the HY-6000 and the smaller 10,000 lbf. Model HY-3000. Write for Bulletin 5-70-A.

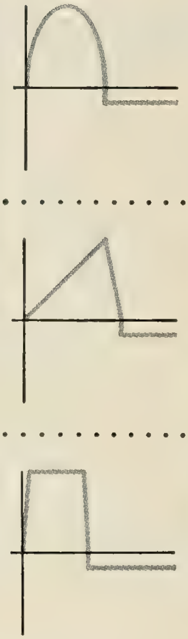
Consolidated Electrodynamics

Rochester Division, Rochester 3, N.Y.

formerly Consolidated Vacuum

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES

Typical shock patterns you can produce repeatedly with the Hyge shock tester



How Hyge works

Differential pressures acting on the upper and lower faces of a piston and seal in an orifice accumulate latent force in the Hyge. This force is released instantaneously when the higher pressure causes an overbalance of upward force to break the seal.

Thrust is transmitted directly through a column to the test platform which rides a braking rail. Pre-selection of metering pins controls the thrust pattern.

Circle No. 141 on Subscriber Service Card.

extensive use of the silicones. Their miniature motors increase operating temperatures—already very high because of the high in-flight ambient temperatures. Silicone rubbers and resins on wires and components, together with supporting silicone laminates and moldings, afford the structural rigidity, dielectric integrity and ultimate in dependability which are necessary under these conditions of severe heat and physical shock.

Silicone Oil Applications

The unusual ability of silicone materials to withstand high and low temperatures and high ozone concentrations also applies to the silicone oils. In addition, the silicone oils offer a range of mechanical properties which suit them for diverse uses.

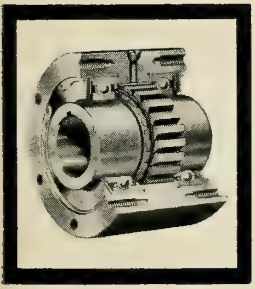
At moderate viscosities the effective liquid range of a silicone fluid, such as L-45 dimethyl silicone oil, is from −40°F to 400°F for short periods. It offers much better resistance to breakdown due to mechanical work than organic oils, and has at the same time very high dielectric strength and corona resistance. Consequently, uses of the silicone oil in missiles and rockets can range from such applications as the fluid in shock absorbers for the *Nike* guided-missile launchers to capacitor fluid material for the electrical systems.

Extensive use of silicone is needed for high-speed missile radomes to overcome the high heat of aerodynamic friction.

The *Nike* shock absorber takes advantage of the long-term stability of the dimethyl oil at all temperatures and its fluidity at low temperatures, which permit the use of the shock absorbers in all climates.

Here and in other applications, the higher compressibility of the silicone oils is used to good advantage. Several hydraulic-system arrangements use the dimethyl fluids because of the good viscosity temperature coefficient.

Electronic systems utilizing fluid-



IS YOUR PRODUCT MODERN IN EVERY WAY EXCEPT ONE?

Take clutches, for example—in aircraft plants throughout the country, modern Formsprag clutches have replaced old-fashioned ratchet and pawl mechanisms as well as their roller-type successors.

This widespread change to Formsprag among designers is, in itself, proof of superiority. Consider, too, Formsprag's other advantages: the patented sprag principle, which allows a Formsprag clutch to deliver more torque per cubic inch of displacement than any other power transmission unit available; ease of installation; and low maintenance cost. An additional feature of its modern design is simplicity, making prototype testing economical.

Remember, too, when it's time to replace your present power transmission—don't *just* replace—modernize with Formsprag. For complete information: send for a copy of the newest Formsprag catalog.

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Designers, engineers and manufacturers of the modern sprag type over-running, indexing, and backstopping clutches for aircraft, automotive, and various industrial applications.

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An Invitation To Join ORO . . . Pioneer In Operations Research

Operations Research is a young science, earning recognition rapidly as a significant aid to decision-making. It employs the services of mathematicians, physicists, economists, engineers, political scientists, psychologists, and others working on teams to synthesize all phases of a problem.

At ORO, a civilian and non-governmental organization, you will become one of a team assigned to vital military problems in the area of tactics, strategy, logistics, weapons systems analysis and communications.

No other Operations Research organization has the broad experience of ORO. Founded in 1948 by Dr. Ellis A. Johnson, pioneer of U. S. Opsearch, ORO's research findings have influenced decision-making on the highest military levels.

ORO's professional atmosphere encourages those with initiative and imagination to broaden their scientific capabilities. For example, staff members are taught to "program" their own material for the Univac computer so that they can use its services at any time they so desire.

ORO starting salaries are competitive with those of industry and other private research organizations. Promotions are based solely on merit. The "fringe" benefits offered are ahead of those given by many companies.

The cultural and historical features which attract visitors to Washington, D. C. are but a short drive from the pleasant Bethesda suburb in which ORO is located. Attractive homes and apartments are within walking distance and readily available in all price ranges. Schools are excellent.

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Professional Appointments

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filled capacitors are using silicones. The long life of silicone fluid suits it for sealed capacitors, and the fluid's high dielectric strength, excellent insulation resistance and low power factor are as important here as its thermal stability. Surface creepage in electrical systems by moisture absorbed on the surface between contacts is defeated by very thin, baked-on films of dimethyl fluids.

Aerodynamic Heating Protection

The exterior surfaces of many missiles and rockets reach high temperatures because of high-speed flight. The glass-reinforced phenolic exterior parts of these units are rapidly deteriorated in mechanical strength at 500°F or higher. Use of aminopropyltriethoxysilane finishing treatment on the glass permits sustained use at higher temperature or short exposure to temperature extremes which were heretofore impossible.

Here, too, coupling of the resin to glass occurs and is believed to be responsible for the effects. Vinyl silane and amino silane glass finishes make these improvements possible.

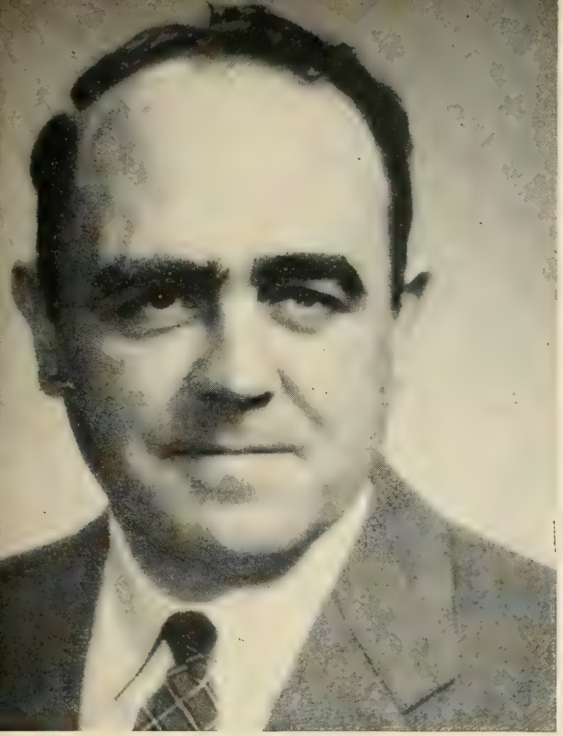
More conventional silicone materials available today are a far cry from what they were 10 years ago, and it is well to have a new look at some of the silicone resins and rubber used for electrical insulation.

Silicone impregnating varnishes have the common functions in all Class H systems of sealing, bonding and filling. The degree to which the silicone varnishes perform these functions is much greater today than ever before. For example, R-620 silicone varnish has improved performance for all three functions due to two significant improvements: first, the bond strength of the varnish is retained even though it quickly cures to a hard waxy film; secondly, the varnish is manufactured and supplied in a diluent which allows immersion or vacuum-impregnation of warm units without fear of component breakdown or varnish thickening.

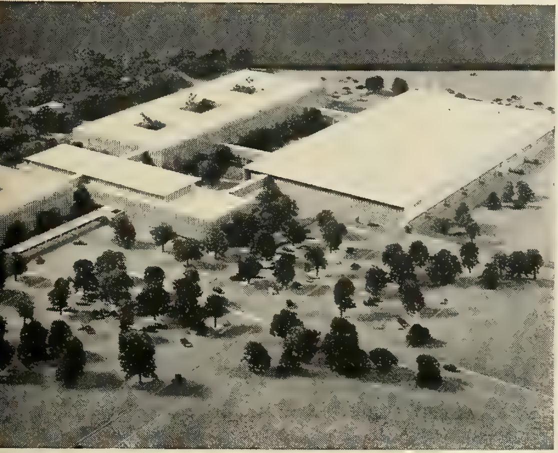
Insulation Improvement

Ground and turn insulation, which has consisted of glass cloth saturated with silicone resins in combination with mica flakes or asbestos, has greatly improved in quality. Uniformity of thickness and retention of dielectric strength at the crease had been major shortcomings of the silicone bonded product, but the new tapes and laminates of today are tough and uniform, and Class H silicone resins have been developed which display better solvent resistance.

Incorporated in glass cloth or



Dennis W. Holdsworth



Pictured above is our new Research and Development Center now under construction in Wilmington, Massachusetts. Scheduled for completion this year, the ultramodern laboratory will house the scientific and technical staff of the Avco Research and Advanced Development Division.

Avco's new research division now offers unusual and exciting career opportunities for exceptionally qualified and forward-looking scientists and engineers.

Write to Dr. R. W. Johnston, Scientific and Technical Relations,
Avco Research and Advanced Development Division,
20 South Union Street, Lawrence, Massachusetts.

IDEALS AND PRACTICALITY

"Science and Philosophy mutually criticize each other and provide imaginative material for each other."... Alfred North Whitehead.

In the increasing preoccupation of science with material things and progress, the truth of this statement by one of our greatest philosophers is often overlooked and forgotten. The scientific philosopher is a rare being and is becoming rarer still, nor can he be adequately replaced by the group technique or the 'brainstorm' session.

It should be one of the noblest aspirations of all our sciences to provide for the true contemplation of the inner meaning of facts and to stimulate that interplay of mind on mind by which alone we may progress.

In all these things, however, we cannot forget the problems peculiar to research and development in private industry. The obligation to work to otherwise-determined time-scales poses a nice problem in balancing ideals against the practicalities of everyday life.

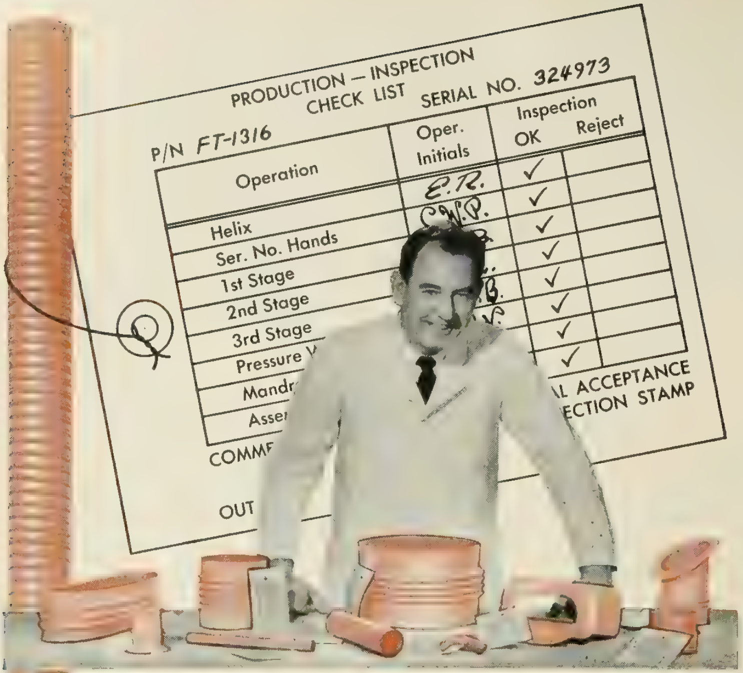
It is in this field that the test of management comes. Its success at meeting such continuously conflicting requirements determines the character and ultimate success of the organization.

With such thoughts as these in mind, we here at Research and Advanced Development Division of AVCO are seeking unique people. We wish to foster the creative minds and fundamental thinkers, while preserving an atmosphere of self-discipline, free from a rigid hierarchy of command and organization.

D.W. Holdsworth

Dennis W. Holdsworth,
Manager, Computer and Electronic Systems Department

Avco
Research & Advanced Development



No "silicone soft spot" ever gets by at FLEXIBLE TUBING

Silicone rubber will not cure properly if it is contaminated by the slightest bit of moisture, grease or dust. To guard against this danger, Flexible Tubing takes extraordinary precautions in the manufacture of its silicone ducting and special shapes.

All raw materials are scrupulously protected against contamination, and every duct and special shape is built in a special department on automated machinery under automatically controlled temperature and atmospheric conditions. Positive air pressure prevents dust from entering the department even when the doors are open and the personnel all wear sanitized clothing. Each part is serialized and inspected at every stage of production. The result is a top-quality, fully cured product that will behave as it is supposed to against the most rigid aircraft and missile specifications.

So turn to Flexible Tubing for silicone ducting and special shapes. The background and experience of our field engineers are available to you. If you have any problems, let us know. We'll be glad to have a man stop by and talk things over. For full information, write **Dept. 213.**

Represented nationally by Aero Engineering Co. and Airsupply Co., and by Associated Industries in Seattle, Washington.

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laminates, R-62 silicone resin offers the added protection of component integrity during subsequent contact with adhesives, varnishes or paints. Very flexible resins such as R-61 retain bond strength in mica glass tapes and laminates when wrapped or formed to their insulation task.

These improvements in inorganic materials and silicone binders, together with application technique improvements on the part of the component manufacturer, have placed effective new insulation material at the disposal of manufacturers of such items as motors, transformers and coils for aircraft, rockets and missiles.

A new silicone resin, especially designed for cold-blending with alkyd, melamine and acrylic-type baking enamels to give them improved color and gloss retention, thermal stability and resistance to weathering, has been developed by Union Carbide. The resin, R-64, is expected to find wide use as a base for aluminum paints to operate in the 500°-1200°F range as protective coatings for engine systems.

A new silicone rubber with exceptionally high conductivity has been developed in the Union Carbide laboratories. This material, K-1516, is compounded with carbon black and has a volume resistivity of less than 10 ohm-cm. Mixtures of this compound with normal silica-filled silicone rubber compounds provide a variety of resistivities. Applied to coils as a tape or from a solvent solution, this material provides an improved corona precipitator. Actually, this rubber is versatile enough to be either a conductor or an insulator, depending on the way it is compounded.

Silicon Rectifiers

All applications outlined here utilize polymeric silicon compounds especially prepared to meet individual demands of the industry. The nonmetallic element is receiving wide usage in its nearly pure form, much of it in the semiconductor field.

Silicon rectifiers offer a most promising range of applications, from extreme cold to high temperature, and from a few watts of output power to very high voltages and currents. Inherent characteristics of silicon allow junction temperatures in the order of 200°C before the material exhibits intrinsic properties. This extends silicon's operating range beyond that of any other efficient semiconductor. The excellent thermal range, coupled with very small size per watt of outpower and extremely high efficiency because of high inverse resistance, make sili-

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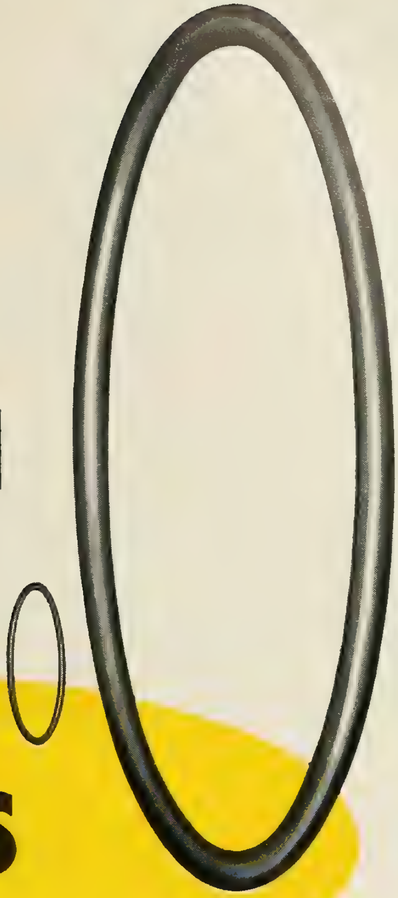
LOW COMPRESSION SET



Butyl "O" RINGS

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nother LINEAR first . . . a new, low compression-set utyl Compound for use in "O" Rings. LINEAR Butyl ompound 7806-70 is a seal material that withstands ompression set at elevated temperatures without being ermanently deformed or losing its resiliency and its alue as a seal. Also, Butyl withstands the chemical ctions of the non-flammable phosphate esters such as Skydrol", "Pydraul" and "Cellulube."

ET, PROVEN

xhaustive tests, under method "B" of the ASTM, how this new LINEAR compound develops only 30 to 40% compression set after 70 hours at 212°F, as compared to the usual 70 to 95% set experienced with previous Butyl compounds. This unusually good resistance to permanent deformation, combined with a tensile strength of 2000 psi and an elongation factor of 275%, make this material an outstanding one for all "O" Ring applications and other molded shapes where Butyl rubber's excellent qualities are desirable.

Whenever you have a seal problem that is tough to handle—look to LINEAR for an answer. Write, or ask the local representative for complete information on LINEAR's new Butyl Compound 7806-70—today.

"PERFECTION IN RUBBER"

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HONEST JOHN artillery rocket depends on G-E electric heating blanket (inset) to bring missile to uniform operating temperature before launching.

HONEST JOHN FIRING SHOWS HOW . . .

General Electric Specialty Heating Maintains Propellant Temperature

Successful launch—and flight—of the Honest John depends upon exact propellant temperature at the moment of firing. A General Electric heating and insulating blanket—which shrouds missile from nose to nozzle—provides and maintains that temperature!

Proper operation of many types of land and airborne equipment, especially at low temperatures, often depends on controlled heat in the right places at the right time. Experienced G-E heating engineers, backed by complete facilities, have already solved thermal conditioning problems on applications ranging from complete missiles and airborne systems to tiny test instruments.

LET US ANALYZE YOUR HEATING PROBLEM. Whether you need a custom-made prototype, or quantity production, investigate G-E "one stop" service for specialty heating products tailored to your specific needs.

FOR MORE INFORMATION contact your General Electric Aviation and Defense Industries Sales Office or send coupon.

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Progress Is Our Most Important Product

GENERAL ELECTRIC

con rectifiers applicable where other semiconductor rectifiers were previously considered impractical.

Silicon, as used in silicon rectifiers, is a nearly perfect single crystal of pure metal to which has been added an element from either group III or group V of the Periodic Table.

Silicon does not readily lend itself to zone refining. Therefore, the most popular method to produce single crystals or pure silicon is crystal "pulling," where a seed of pure single-crystal silicon is dipped into molten silicon, rotated slowly and withdrawn at a predetermined rate. A major problem in crystal "pulling" is to keep the resultant crystal free from contaminants. Molten silicon is very active and attacks the materials used in containers and holders. Quartz crucibles are commonly used and the entire process is conducted in an inert atmosphere to reduce the possibility of contamination. Temperature of plus or minus 0.1°C at approximately 1430°C must be maintained.

When it is determined that the crystal has resulted in the desired type, and that the resistivity is within the range that will produce suitable voltage ratings, the crystal is cut into thin slices and finally into small wafers or dice of desired size and thickness.

After suitable etching and grading to separate wafers that do not conform to established thickness specifications, the dice are alloyed by a special process. Alloying is conducted at high temperatures and provides not only a junction on one side of the wafer but a low ohmic contact on the base. Low resistance contacts are important, since once the internal space charge is overcome the resistance of the cell decreases exponentially and contact and lead resistances become factors limiting current flow.

Alloyed dice are brazed to a base and then hermetically sealed after a contact is provided to the alloyed side. Extreme care must be taken during the mounting and assembly operations to keep the surface free from contamination of any type since contaminants will ionize and shunt the junction.

Final electrical and mechanical tests are performed before and after successive heat cycles to make certain that the rectifier is stable under all conditions of temperature, humidity, altitude and shock.

Silicone chemistry has contributed immeasurably to the sensational development of rockets and missiles. Engineers are looking to silicones to satisfy many of the complex requirements of the missiles of tomorrow.★

Readying the Range for the Space age

takes a lot of know-how!

- Planning
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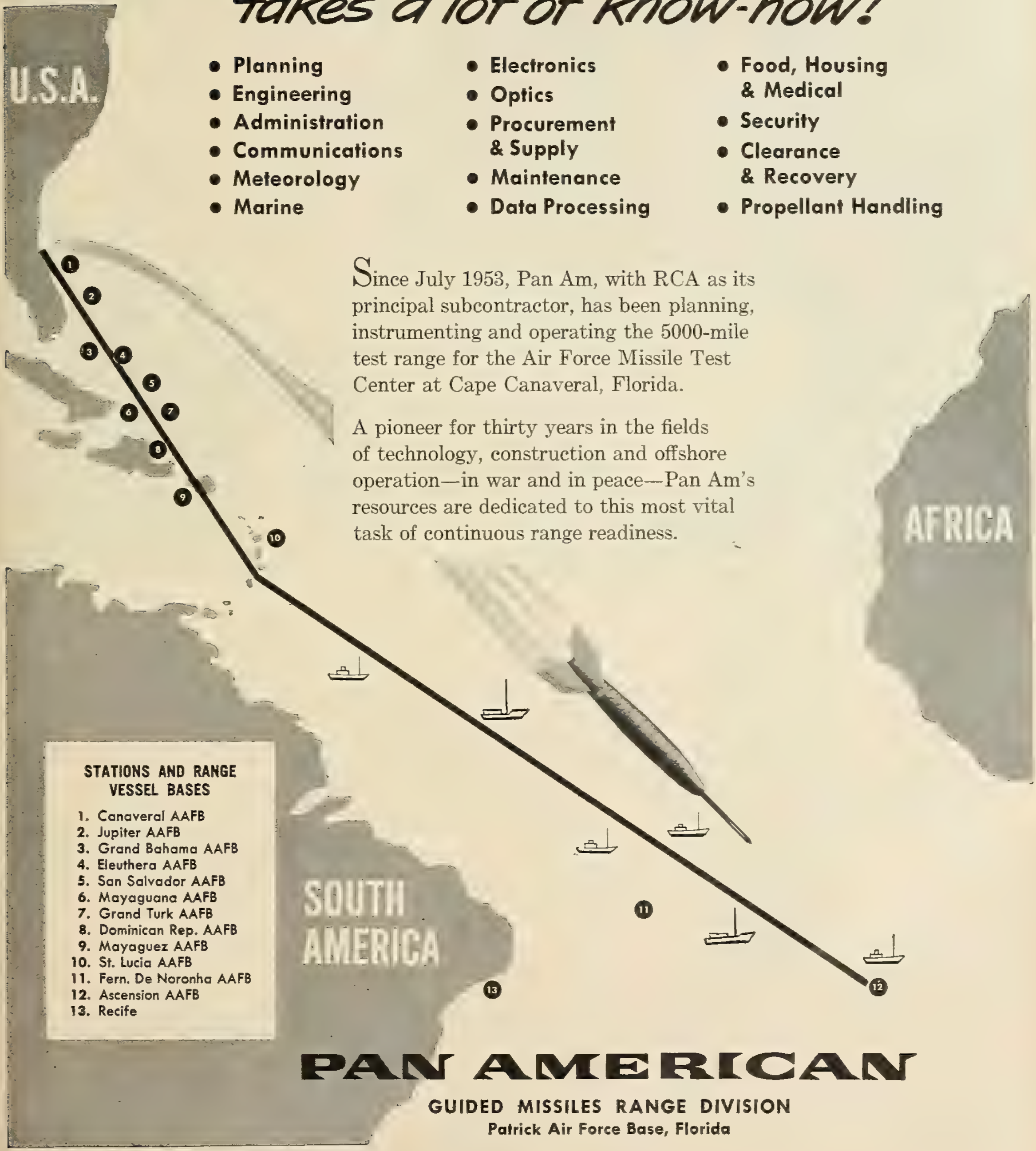
- Administration
- Communications
- Meteorology
- Marine
- Electronics
- Optics
- Procurement & Supply
- Maintenance
- Data Processing
- Food, Housing & Medical
- Security
- Clearance & Recovery
- Propellant Handling



Since July 1953, Pan Am, with RCA as its principal subcontractor, has been planning, instrumenting and operating the 5000-mile test range for the Air Force Missile Test Center at Cape Canaveral, Florida.

A pioneer for thirty years in the fields of technology, construction and offshore operation—in war and in peace—Pan Am's resources are dedicated to this most vital task of continuous range readiness.

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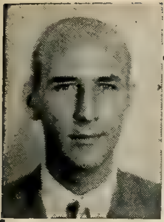

Propulsion Engineering

by Alfred J. Zaehringer

Ion rocket performance measured. Giannini Research Lab reports helium gives an I_{sp} of 600 seconds. Heavier ionization could result in a specific impulse of near 1000 seconds. The measurements were reported at an USAF advanced propulsion symposium held recently in Los Angeles.

•

Hydrocarbons are still king fuels. They are still bigger production items than boron fuels, alcohol, aniline and hydrazine. Yet, hydrocarbon rocket fuels account for only an insignificant portion of U.S. production.

•

Hypervelocity missile launcher. Naval Ordnance Laboratory at White Oak has fired projectiles from a gun using hydrogen-oxygen mixture as a propellant at chamber pressures of 65,000 psi. Small missiles (on the order of 10 grams weight) can hit a velocity of about 15,000 ft./sec. Plugging the barrel results in pressures of 21,300 psi and temperatures of 3710°F. The launcher may be a novel reaction vessel to study new chemical pressures now difficult to attain.

•

Smog-free LOX? Air Products has completed two LOX plants in California for rocket testing. One is a $3-million plant at Boran, Calif. The other is a $4-million facility that serves Aerojet at Sacramento. The latter plant also produces nitrogen.

•

Promising ceramics for nozzles are titanium boride, titanium carbide, zirconium boride and zirconium carbide. The Carborundum Co., working on these materials, reveals that its KT-silicon carbide can take 4260°F in a neutral atmosphere and 2730°F in an oxidizing atmosphere. The material is 96.5 per cent SiC and has 97 per cent of the theoretical density. Unlike other ceramics, KT-SiC acts as its own binder. Its good tensile strength makes it a candidate for rocket nozzles.

•

Impulse loss of control vanes in rocket exhausts. This is slight say Langley Field scientists of NACA who tested both polished SAE 1020 steel and carbon graphite vanes in the 6.25-inch *Deacon* rocket motor. The steel vanes were entirely satisfactory for stabilization. Four vanes pulsed to ±12.5° result in a 3.6 per cent impulse loss. At maximum deflection there is a 4.5 per cent loss and about 3 per cent for zero deflection.

•

New boron advances. Scientists at the University of Michigan have reported work on new, high-energy, highly reactive compounds of boron, nitrogen and phosphorous. Also important is the working arrangement between Thiokol and Callery Chemical to develop HiCal boron solid fuels. Stauffer Chemical and Aerojet-General have joined hands to form Stauffer-Aerojet Co., presumably to work on boron solids.

•

Chemicals for solids. Look to increased markets for the following solid oxidant materials: ammonium nitrate, ammonium perchlorate, lithium nitrate and perchlorate, and diethylene glycol dinitrate. Nitroglycerine and nitrocellulose may also chalk up sales gains. Gaining solid fuel-binders will be the polyesters, polysulfides, epoxy, and synthetic elastomers. Showing R&D gains will be decaborane, polycarbonates, phenolics, vinyls, polyamide and polyurethane.

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MISSILE AGE

By Norman L. Baker

Chemical Milling Key to *Thor, Jupiter* Structure

The *Thor* and *Jupiter* IRBMs are fabricated by a new concept in missile structure design, developed to achieve maximum weight saving with an overall increase in body strength. This has been made possible by the use of large integrally stiffened panels chemically milled to the thickness desired.

The United States Chemical Milling Corp., contractor to both ABMA and Douglas, has been milling parts for the *Thor* and *Jupiter* body structures in the form of very large panels. The panels, three feet wide and over 25 feet long, are milled to exact tolerances of ± .003 inch.

Missile designers have long taken full advantage of the weight saving, heat resistance and superior strength made possible by the extensive use of light metals, such as aluminum and titanium. However, machining of these materials, especially titanium, is extremely difficult. But now, through recent advances in the art of chemical milling, further impressive weight saving is made possible. North American Aviation was one of the first companies to utilize chem-milling for the manufacture of small airplane parts during World War II.

Eight of the 3-by-25-foot panels are interlocked to form a cylindrical shell 24 feet in circumference which forms the ballistic missile body. Missile fuel and oxidizer tanks, being cylindrical in shape, fit neatly inside the shell formed by the panels. For some applications, this outside shell actually forms the exterior of the tanks. In other words, the tanks are an integral part of the missile structure. Several bulkhead rings are used to give the shell additional structural rigidity.

The individual panels are extruded and then stretch-formed into an eighth of a circular arc. Locking members on either side and two I-section stiffeners are extruded from the original plate. To allow the metal to flow properly during the extrusion process, a section thicker than required to withstand the stresses is used. Such a heavy panel could not be used for a missile without suffering a large weight penalty.

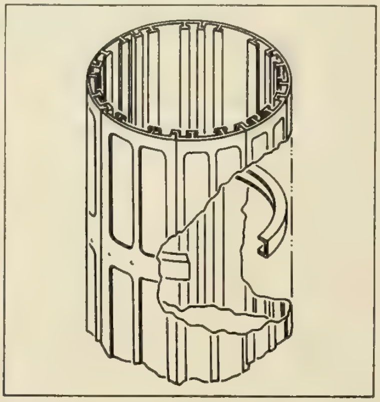
Overall weight reduction was accomplished by chemically milling the entire panel down to a thickness that will carry all loads. Additional design and weight advantages are obtained by providing a taper over the 25-foot length. More than 10 pounds of weight penalty are removed from each panel, resulting in an overall weight reduction of more than 80 pounds.

The bulkhead rings, to which the panels are attached, are first extruded into a channel section, and then chemically milled to remove unnecessary weight after they are rolled into rings. Removal of weight on both parts and the tapering of the panels could not have been done in any other way.

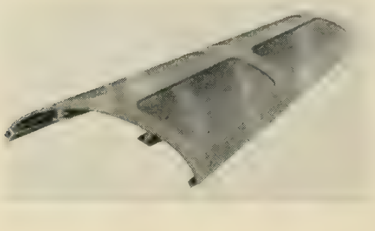
Titanium and supersteel alloys are extremely difficult to form and machine in a conventional manner, and as a result have been greatly limited in their applications. However, it is now possible to produce almost any shape or contour, such as these complicated panels, because of chemical milling.

With a pound of unnecessary weight removed from a missile, approximately 18,000 feet of additional altitude and an extended increase in range can be gained by the ballistic missile. Such gains in missile performance, which have been made possible through chemical milling, are vital in the continuing struggle to improve mass-ratio values.

The list of missile programs utilizing chemically milled components is extensive. The numerous applications of this process have proven that no design is too complex for at least a partial chemically milled operation.



Integrally stiffened panels 3 feet wide and over 25 feet long are chemically milled to exact tolerances of ± .003 inch for fabrication of THOR and JUPITER.



Electric Boat to Build Ballistic Missile Subs

A naval shipyard and one private yard have been selected to construct the three nuclear-powered fleet ballistic missile (FBM) submarines recently approved by Congress in the fiscal 1958 supplemental budget.

The Electric Boat Division, General Dynamics Corp., Groton, Conn., will build two submarines subject to acceptable contract negotiations, and the Mare Island Naval Shipyard will build one.

These two yards were selected because, in the Navy's judgment, these assignments will permit the earliest possible completion date. Rear Adm. A. G. Mumma, USN, chief of the Navy's Bureau of Ships, said that capabilities of other qualified yards will be further considered when additional *Polaris* submarine construction programs are approved.

Orders for reactor compartment components for these three ships, including long lead-time components such as pressure vessels, pumps, steam generators, main turbines, gears and other auxiliary components, are in process.

They will differ from nuclear-powered submarines now under construction chiefly in their missile features, R.Adm. W. F. Raborn has announced. Their hull configuration, similar to that of the USS *Albacore,* will give them high underwater speed. They will be equipped with SINS, the Navy's revolutionary new navigation system, and with new stabilizing and electronics equipment incorporating the most recent engineering advances.

EG&G Under Contract for Nuclear Rockets

An Atomic Energy Commission contract with the firm of Edgerton, Germeshausen & Grier, Inc. will include work on the program aimed at developing nuclear propulsion systems for rockets and missiles.

Under the contract EG&G has been given the responsibility of installing and operating some of the control and measuring systems planned for use in the testing of nuclear reactors which may lead to the development of nuclear rocket propulsion systems. The project is under the direction of the Los Alamos Scientific Laboratory.

Tests will be conducted at the Commission's Nevada test site where EG&G has been responsible for some of the sequence timing, instrumentation and technical photography in all of the tests of nuclear devices conducted there.

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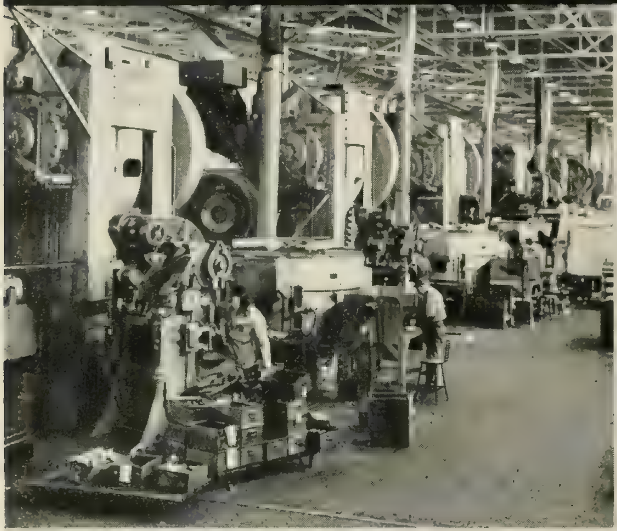

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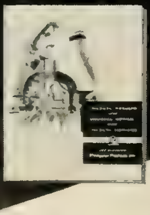

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Goodyear Boosts Astronautics Division

Goodyear Aircraft, one of the first companies to get into the astronautics field, recently announced that its activities were to be expanded. Studies performed by Goodyear under current military contracts have led the advanced planning for further space orbiting and travel. The company's astronautics section is comprised of a large group of engineers and scientists engaged in studies directly connected with space travel or closely allied with it. Many of these studies bear directly on investigation of the problems of establishing a manned space satellite.

Goodyear astronautics engineers feel that true domination of space does not really start until man has been placed in orbit around the Earth and returned to Earth again safely. From then on, trips to the Moon, Venus, Mars and possibly other planets, are only a matter of time.

Darrell C. Romick, widely known authority on space travel, heads the astronautics section. He has been to Europe to give papers before the International Astronautical Federation and has talked before scientific and engineering groups in all parts of this country since the early 1950s. As a member of the American Rocket Society, Romick was one of the scientists who recently sent their space flight recommendations to the White House.

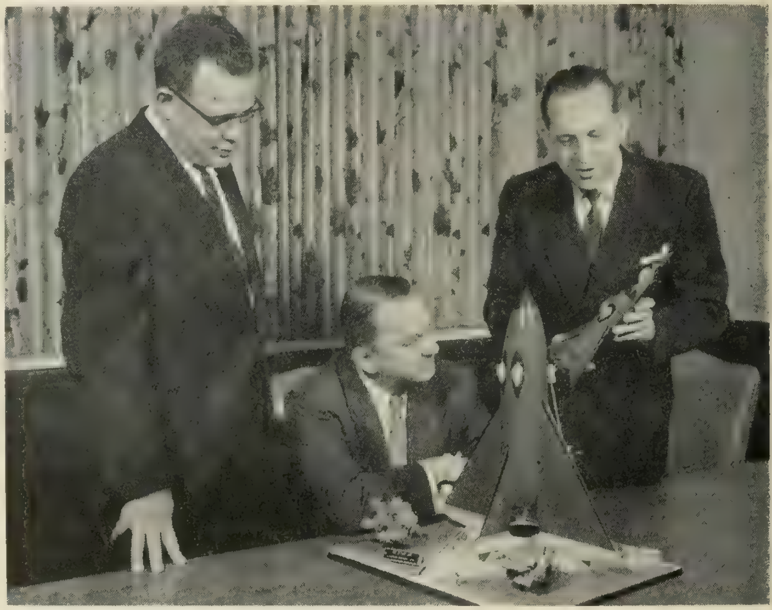
From the studies made by Romick and several other engineers, notably Richard E. Knight and Samuel Black, there has evolved a concept for a three-stage rocket to get man into orbit and bring him back, with this difference—the two booster stages would be also manned and recoverable for reuse.

The concept is called *Meteor* and a smaller version, less costly and which can be put into operational status within six to eight years, is called *Meteor, Jr.*

In the *Meteor* concept, Romick visualizes three delta-wing aircraft taking off vertically and nested tail in nose, the first booster separating from the group at about 35 miles altitude and returning to Earth in a ballistic-hypersonic glide.

On making a conventional landing, the booster is fitted with jet engine pods and fairing, and makes a conventional airplane-type flight back to the original launch site. The same thing occurs with the second stage, except that, due to higher altitude and greater speed at separation, it would land at a more distant point from the launch site. The third stage would likewise be capable of making an unpowered glide back to Earth.

The astronautics section has worked out not only the requirements for the rocket vehicle itself in considerable detail, but have made advanced studies of necessary ground-



Thomas A. Knowles (seated), president of Goodyear Aircraft Corp., is briefed on the company's space flight program by Darrell C. Romick, head of the astronautics section. E. A. Brittenham, chief engineer, is at left. Romick is holding model of the METEOR, JR.

Another Milestone in the Growth of the Missile Market

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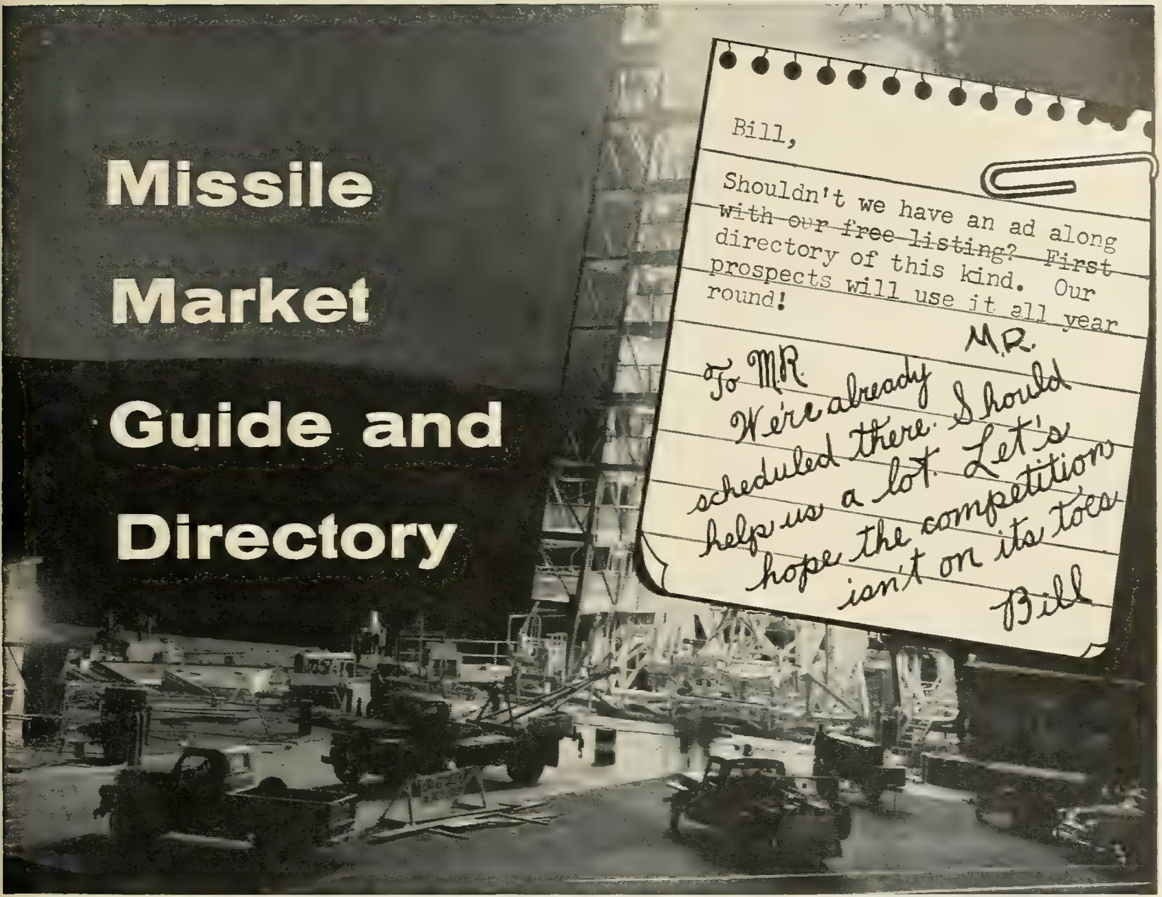

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It will offer the first complete, classified listing of all manufacturers serving the missile market under 10 major heads and over a thousand sub-heads. All listings are free. Major breakdowns include such categories as MISSILE FRAME MANUFACTURERS, PROPULSION SYSTEMS, GROUND SUPPORT EQUIPMENT, GUIDANCE EQUIPMENT, TRACKING AND TELEMETERING EQUIPMENT, ETC. In addition to the classified section, there will be a missile catalog listing all of the different items going into a missile . . . an alphabetical list of all manufacturers of missile components, electronic equipment, hardware, etc. . . . a list by company of the people who specify and buy missile equipment . . . and many other features of interest.

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handling equipment. The permanent earth satellite has been extensively studied and provision has been made to house technicians and scientists while the vehicle speeds around the Earth at 16,500 mph. There will be laboratories, living quarters and as many other of the normal conveniences of Earth-life as possible.

Goodyear has emphasized that even though a system such as *Meteor* would be costly to develop and take time to get into operating status, figures show that economies inherent in the concept make it an attractive way to approach the problem.

Engineers Sought by Boeing Airplane Co.

Boeing Airplane Co. currently is seeking several hundred engineers for work in all Seattle-area divisions, it has been announced by Stan Little, employment administrator.

Boeing is particularly interested in hiring engineers with advanced degrees and those with electronics background, he said. Many of the new engineers will be assigned to the pilotless aircraft division, where work is under way to accelerate the pace of *Bomarc* IM-99.

Engineers also are needed to step up developments in other divisions.

New X-ray Developed to Inspect Solids

A new high-voltage X-ray generator for detection of flaws in solid rocket and missile fuel charges has been developed jointly by High Voltage Engineering Corp., Thiokol Chemical Corp. and the Friez Instrument Division of Bendix Aviation Corp.

Internal cavities, cracks, fissures or bits of foreign material can affect performance of the missile since there is a critical predetermined balance ratio between the missile charge and the centerline of the missile proper. In actual operation, as the combustion line advances along the propellant charge surface, hidden pockets or cavities can result in uneven burning, conceivably affecting the forward thrust of the missile and altering its course or possibly burning a hole out the side, destroying the missile itself.

Inspection of solid propellants heretofore has been a costly, cumbersome process. Radiographic film is wrapped around the outer surface of the missile or arranged in a flat plane. X-rays are passed diametrically through the fuel, with resultant exposure of film.

Limitations of this technique are due to the high loss of intensity incurred by the X-rays as they pass through the entire thickness of the missile before exposing the film. Engineers concluded that if a small and powerful enough radiographic generating unit could be developed, it might be lowered into the hollow core of the fuel, cutting penetration requirements by 50 per cent.

Thiokol contacted High Voltage on design of a special Van de Graaff X-ray generator for this particular application. High Voltage engineers devised a special 10-foot electron-tube extension for one of their standard supervoltage machines, which would slip down into the propellant core. High energy X-rays are generated from the tip of the tube to concentrate intensity in one direction at a relatively acute angle.

Engineers at Thiokol then moved forward on development of a handling system. This system consists of a rotating base or platform where the fuel charge is placed on end. This platform also has a vertical range of movement equal to half the length of the longest fuel castings.

A Lumicon viewer, manufactured by the Friez Instrument Division of Bendix Aviation Corp., is mounted in a fixed position to one side, with the 10-foot extension of the Van de Graaff generator coming down in a fixed position through the ceiling. The accelerator itself is mounted in a room above.

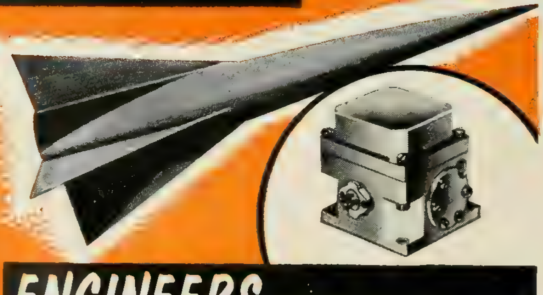
Method of operation consists essentially of rotating and raising the fuel charge, spiral-fashion, about the X-ray source. The charge is raised a few inches during each revolution. Thus the fixed X-ray source, monitored on the Lumicon receiver outside, provides a continuous radiographic picture covering the entire volume of the fuel charge.

Directors and Officers Named by Astrodyne

Officers and directors to head Astrodyne, Inc., have been named following incorporation of the company to specialize in solid-propellant activitie in Delaware.

Officers of the new corporation include: president, J. L. Atwood, who i president of North American; vice president, R. W. Thomas, who is Phillip vice president for research and development; treasurer, R. A. Lambeth, who is North American's vice president finance and its treasurer; and secretary Paul J. Parker, who is secretary and assistant treasurer of Phillips.

Eight officials of the two founding companies were elected as director



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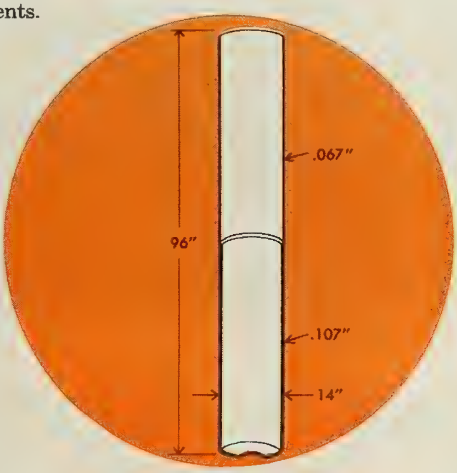

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of Astrodyne. From North American, they were J. L. Atwood, R. A. Lambeth, J. S. Smithson, vice president-administration; and S. K. Hoffman, vice president and general manager of North American's Rocketdyne division.

Phillips officials elected as directors of the new company were: Paul Endacott, president; Stanley Learned, chairman of the executive committee and assistant to the president; W. W. Keeler, executive vice president.

The new company will have its headquarters and operations at Air Force Plant 66 near McGregor in central Texas where Phillips has conducted solid-propellant research and development for the Air Force since 1952 and currently employs about 900 people. Phillips employees at Air Force Plant 66 and some of North American's personnel will transfer to the new company.

Astrodyne officials explained that within a few weeks contracts and operations for the government at Air Force Plant 66 would be transferred to Astrodyne subject to Air Force approval of the company's proposal.

Col. John Paul Stapp, renowned authority on aviation medicine, holds a chunk of the solid rocket fuel, developed by Phillips Petroleum Co. The fuel powered the huge "Megaboom" rocket motor built by Phillips. This new motor accelerated a rocket sled to 1337 miles per hour in a few seconds. At the instant of peak speed, it was producing about 112,000 lbs. thrust.

Girdler Building Callery Hydrogen Plant

A $3.4-million contract to design and build hydrogen, nitrogen and carbon dioxide producing and purifying units for Callery Chemical's high-energy fuel plant has been awarded to the Girdler Construction Division of National Cylinder Gas Co.

Callery Chemical, prime contractor for the Navy's $38-million plant

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Checking the lead of the internal gear used in the second stage of the Sikorsky S-58 Helicopter. Permissible lead error is only .0003 in. of face. This gear is finish cut at 50 Rockwell C. It's actually much harder than a good penknife blade.

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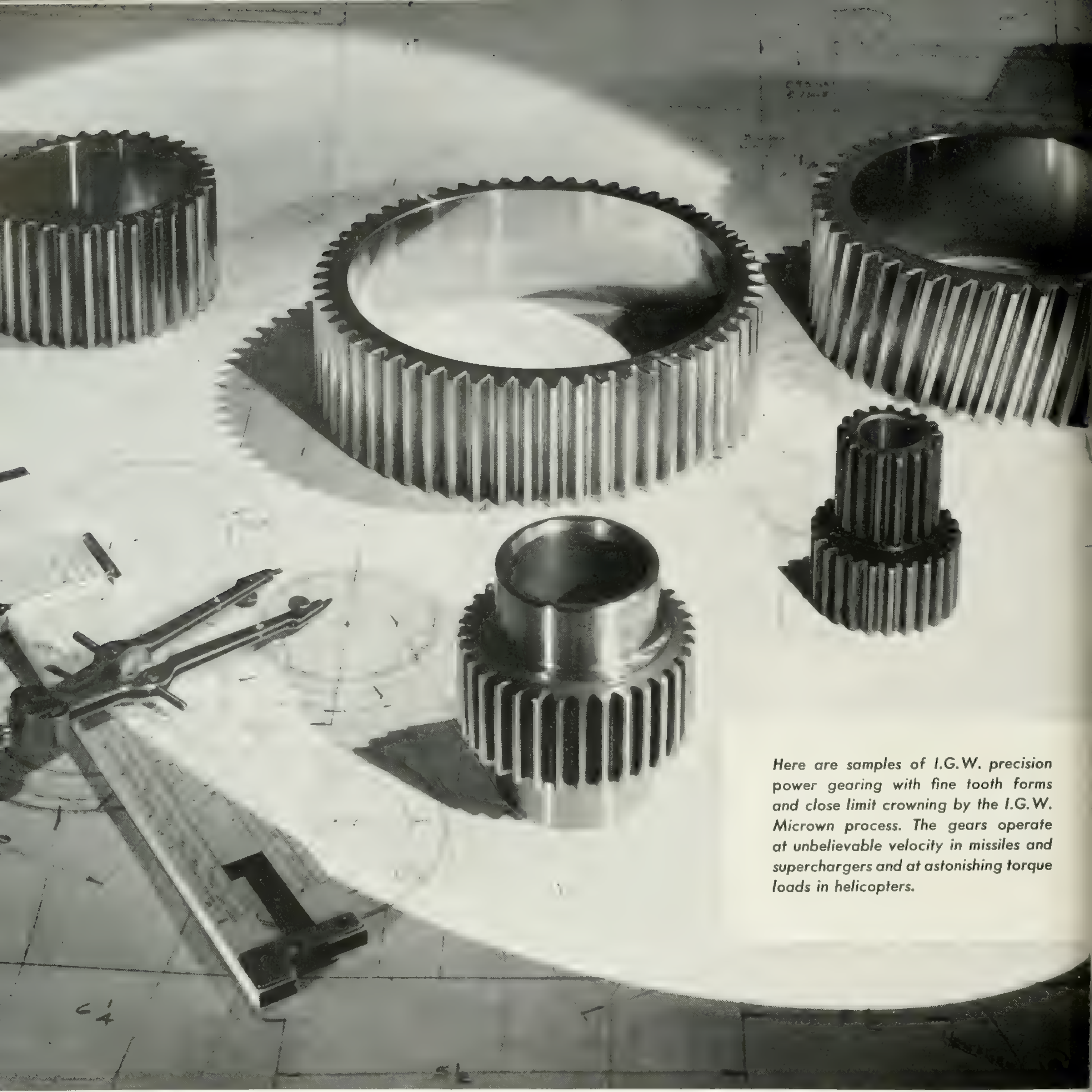

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now under construction at Muskogee, Okla., announced that Girdler Construction will furnish all engineering, apparatus, material and complete field construction and start-up services for the high-purity industrial gas plants. The Muskogee plant, scheduled for completion at the end of 1958, will produce tonnage quantities of the high-energy boron fuel for powering jet aircraft and missiles.

The subcontract includes a plant to produce hydrogen as raw material to be chemically processed for its end role in the high-energy fuel molecule. Additional Girdler plants on the Muskogee site will produce nitrogen, an inert gas to be used as a protective atmosphere in various processing steps, and carbon dioxide. Storage units for hydrogen and nitrogen are included in the contract. Completion of the Girdler units is scheduled for late summer. Specialty catalysts for the hydrogen plant operation will be produced by the Girdler catalyst plant in Louisville.

$2-Million Expansion Set for Martin-Denver

A new two-story structure, totaling 115,000 square feet, is to be added to the factory at the Martin-Denver facility at a cost of approximately $2 million.

A $125-thousand contract has been awarded to Connell, Pierce, Garland & Friedman, Miami, Fla., for planning and designing the new building. The Miami firm recently completed the new Martin-Orlando plant, one of the largest industrial installations in Florida.

Preliminary plans for the Denver project will be started immediately, with construction to begin on June 1 and completion due by January 31, 1959. When occupied, the new factory addition will eliminate storage and warehouse operations now located in Denver.

First ICBM Squadrons to be Activated April 1

The first two intercontinental ballistic missile squadrons will be activated at Camp Cooke, Calif., on April 1. The Air Force announced that the two are: the 576th Strategic Air Command Intercontinental Ballistic Missile Squadron and the 393rd ICBM Training Squadron.

The 393rd Training Squadron will be responsible for the training of the 576th and later squadrons. The 576th Squadron will move to Francis E. Warren AFB, Wyo., after completion of training. Commanders for the groups have not been announced.

Brooklyn Polytech Gets Rocket Research Grant

Polytechnic Institute of Brooklyn will conduct a year-long study of combustion instability and scaling-up of rocket motors using liquid propellants under a grant of $50,000 awarded by the Air Force Office of Scientific Research.

Largely concerned with analytic formulations, the contract also calls for experimental work entailing an exhaustive study of fuel injection units under a wide range of conditions. For this phase of the research two combustion chambers have been constructed in Polytechnic's rocketry laboratory.

The contract is under the direction of Dr. T. Paul Torda, professor of mechanical engineering. Dr. Torda's work on liquid-fuel rocket motors dates back to World War II when, as a graduate student at Polytechnic, he worked with a 15-man team on the study of various problems connected with the first Navy jet aircraft. A native of Budapest, he joined the faculty of the University of Illinois in 1949 after receiving his doctorate at Brooklyn Poly. In 1955 he returned to Polytechnic as a full professor.

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contract report

Trends

The volume of contracts being let by the Government has now returned to a somewhat normal pace. However, money for performing on these contracts has still not been released. This is because of an astounding amount of confusion in Washington, added to the "conventional" volume of red tape. One reason for the hold-back on money is the fact that there is still not a space-flight program in Washington—four months after *Sputnik*. Nobody has the courage to make a decision.

$ $ $ $

Write and ask for a copy of House bill H.R. 8002 which would return Government accounting to an accrued expenditure accounting system. It could mean some drastic changes in how you plan ahead. If you've got objections, write them in to your Congressman.

$ $ $ $

The right of the Government to unlimited use of technical data developed by Government contractors is under dispute again. Contractors interested in gaining greater protection for their commercial "rights" and interests should make themselves heard.

$ $ $ $

Three new revisions of the Armed Services Procurement Regulations have been made public—Revision No. 27, dated January 2, effective April 2; No. 28, dated January 28, effective April 28; No. 29, dated February 5, effective May 5. These cover unacceptable bids, patent rights and mistakes in bids, and bid-form preparation. All are available from the Superintendent of Documents, Washington 25, D.C.

$ $ $ $

Air Force is using a new contract clause which limits reimbursements made to contractors. It reads: "Notwithstanding any other provision of this contract, the Government shall not be obligated to reimburse the contractor, for work performed under this contract, any sum which is in excess of the cumulative amounts indicated for each period specified in the following Schedule of Reimbursement." It doesn't limit the final amount which you get under a contract, but it does limit how much is paid in the form of progress payments.

$ $ $ $

Don't go running to ARPA (Advanced Research Projects Agency) for business. It will be three months at a minimum before the new Defense Department agency really has an idea of what it's supposed to do. Even then, most of the funds over which it has control will be allocated for research rather than production projects.

$ $ $ $

If it's any help for your morale, Defense Secretary McElroy says that missiles will get 24 cents out of every procurement dollar in fiscal year 1959, when share for manned aircraft drops to 50 cents.

$ $ $ $

This is a period of flux. Congress is still trying to find out just what has been and is going on. The Executive seems even more in the dark. In a word, everyone is waiting for everyone else to make their minds up so that they can go along with the crowd. This will all sort itself out in a fairly short time. Meanwhile, any selling you do now will pay real hard cash dividends later when definitive programs get under way. The pressure to do something—to get on with it—is building up to a point where even bureaucratic Washington will be unable to resist it. The chips are still down despite the success with *Explorer*.

Awards

For nuclear warhead test equipment: Nuclear Instruments Division of Telecomputing Corp. has been awarded a $1,000,753 addition to existing Army Ordnance contracts.

For service test of liquid rocket engines: Reaction Motors, Inc., has received a $3,027,266 contract from Air Materiel Command.

Nuclear Rocket: Rocketdyne Division of North American is working on nuclear rockets under contracts administered by the Wright Air Development Command in coordination with the Atomic Energy Commission.

RAT: Allegany Ballistic Laboratory has received contracts to build the rockets for Navy's new rocket-launched torpedo. **Librascope, Inc.,** has the guidance contract.

Re-entry: Aeronutronic Systems Division of Ford has received an Air Force contract to study gas interactions of ICBM nose cones upon atmospheric re-entry.

Hawk: Raytheon Manufacturing Co. has received a $13,249,594 contract for procurement of *Hawk* missiles and components; includes an estimated 20% of subcontracting for missiles and supporting ground equipment.

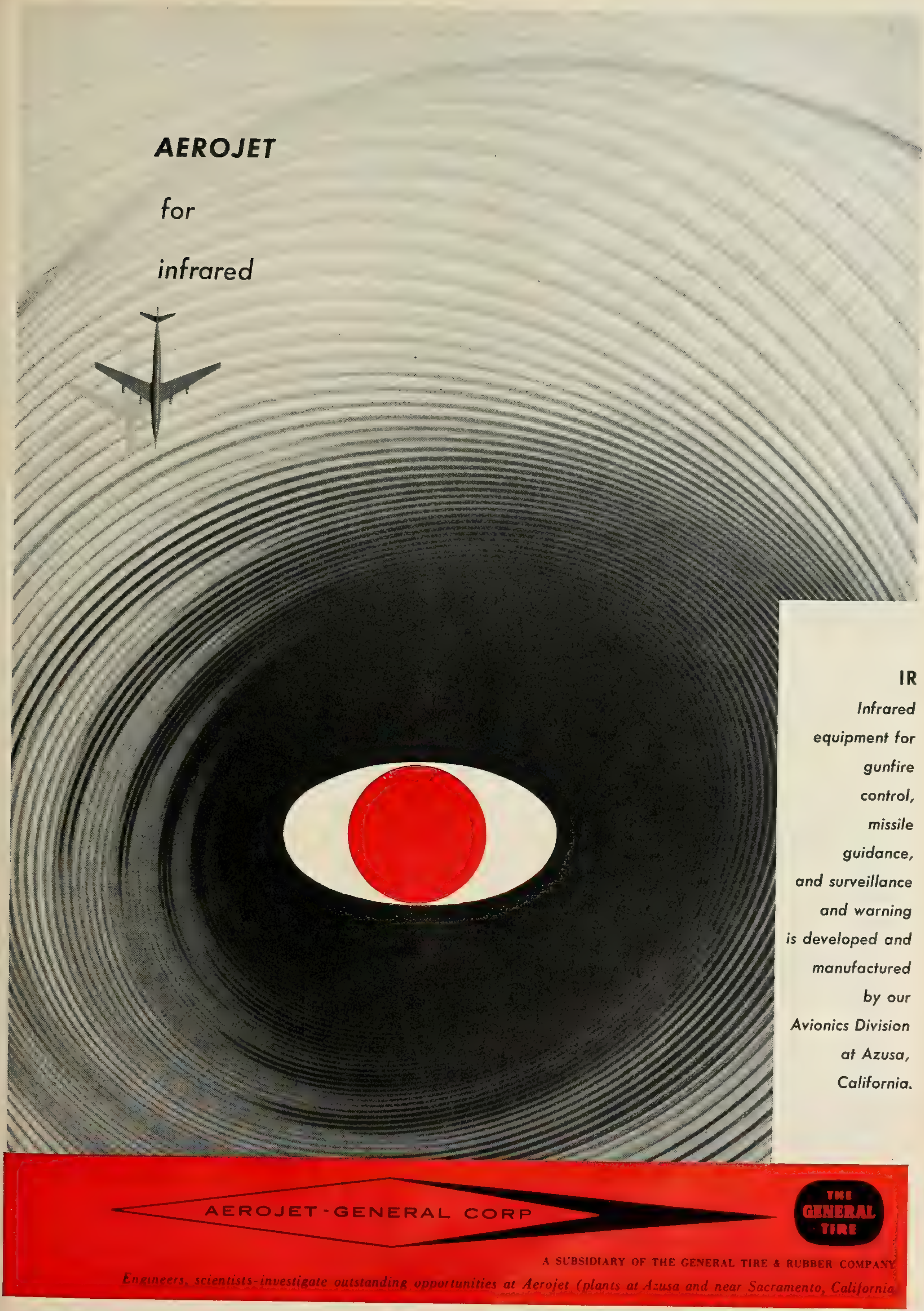
Falcon: Hughes Aircraft has received a $19,278,275 contract for GAR and GAR-3 rockets. Hughes has also received a $21,188,717 contract for interceptor aircraft and weapon control systems.

Logistical planning: Planning Research Corp. has received a $234,000 contract for a detail study of requirements for logistic support of the Army during 1960-70.

Bell Aircraft has received two subcontracts for work in its Avionics and Rocket divisions, but cannot reveal details due to security.

Countermeasures: Hoffman Electronics Corp. has received an $11-million Air Force contract to develop the electronic reconnaissance system known as Tall Tom (AN/ALD-3). Subcontractors include **Cornell Aeronautical Laboratory, Inc.; Filtron Co., Inc.; Lockheed Aircraft Services, Inc.; Olympic Radio and Television, Division of Siegler Corp.; Radiation, Inc.; Sanders Associates, Inc.;** and **Stanford Research Institute.**

Additional missile contracts placed during the month include: **Radiation, Inc.,** $230,000 for increase in funds . . . **Potter Instrument Co.,** $50,000 for increase in funds . . . **Westvaco Chlor-Alkali Div. of Food Machinery & Chemical Corp.,** $38,157 for rocket propellant.



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Contract Awards

Cubic Corp., $85,877 for increase in funds . . . **Aerophysics Development,** Santa Barbara, Calif., $1,325,000 for *Dart,* antitank guided missile . . . **Douglas Aircraft Co., Inc.,** $136,750 for repair parts for *Nike* system . . . **Giannini Research Corp.,** $105,243 for material testing by means of plasma jets . . . **Reynolds Industries, Inc.,** $63,490 for antenna items.

North American Aviation, Inc., $1,167,000 for engineering, investigation and development . . . **Firestone Tire & Rubber Co.,** $511,003 for ground handling equipment for guided missiles . . . **Grand Central Rocket,** $232,955 for propellant development . . . **Consolidated Diesel Electric Corp.,** $106,695 for missile handling skid . . . **Edcliff Instruments,** $110,360 for accelerometers.

G. M. Giannini & Co., $232,422 for accelerometers . . . **Reynolds Metals Co.,** $82,837 for various aluminum shapes, mostly sheet . . . **McDonough Construction Co., of Fla.,** $1,244,000 for rehabilitation of base facilities and electronic radar laboratory for AF-WS-219-L downrange facility, Naval Station, Trinidad, British West Indies (WS-219-L, Classified).

Haller, Raymond & Brown, Inc., $42,572 for additional research and study for 12 months to continue investigations of the vulnerability of electronic equipment . . .

Radio Corp. of America, $42,000 for RCA data reduction unit #DRU-1 . . .

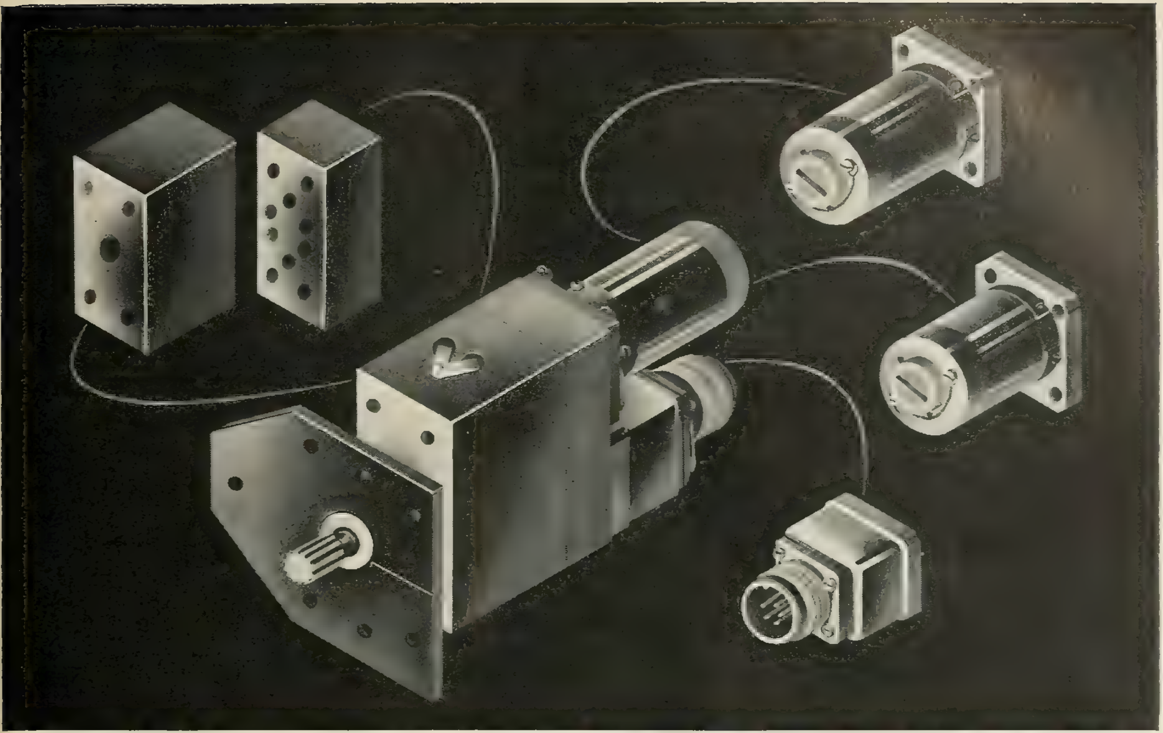
Stanford Research Institute, $30,576 for research work for 12 months toward development of techniques of dielectric materials . . . **National Co., Inc.,** Malden, Mass., $472,060 for frequency standard-NC 1001 . . . **Levinthal Electronic Products, Inc.,** $90,200 for klystron transmitter, type PC-49.

Burroughs Corp., $39,000 for rental of electronic digital computer for month of Feb. 1958 . . . **Linde Co., Div. of Union Carbide Corp.,** $25,500 for liquid oxygen . . . **General Chemical & Dye Corp.,** $63,580 for chlorine and trifluoride . . .

Aeronutronic Systems, Inc., $35,995 and **Gilfillan Bros., Inc.,** $39,853 for feasibility study on antitank guided missile system . . . **Firestone Tire & Rubber Co.,** $1,195,365 for *Corporal* handling and launching equipment . . . **The Pennsylvania State Univ.,** $44,991 for research and reports concerning structures of complex ions and their salts . . .

Arthur D. Little, Inc., $40,493 for research and reports concerning combustion ignition . . . **Yale Univ.,** $31,000 for research and reports concerning study of functional equations and spectral operations . . . **Univ. of Maryland,** $41,254 for research and reports concerning mathematical studies in fluid dynamics and elasticity . . . **Washington Univ.,** St. Louis, $49,982 for continuation of research on paramagnetic resonance of free radicals.

Nems-Clarke Co., Div. of Vitro of America, Silver Spring, Md., $64,470 for increase in funds . . . **Centronix, Inc.,** Cocoa, Fla., $116,500 for central timing records . . . **The Univ. of Chicago,** $39,941 for research relating to temperature and radiation in atmosphere . . . **The N. Mex. College of Agriculture & Mechanic Arts,** $289,631 for personnel engineering, materials and facilities to assist in support of *Talos* missile program evaluation . . . **Stevens Inst. of Technology,** $32,200 for personnel, materials and facilities to conduct research in connection



This new Airborne modular actuator—rated 20 lb./in. at 26 v d-c—is not a standard model in the usual sense. Rather, it is merely one example of the many different rotary actuator packages that can be assembled from Airborne's new line of standardized, interchangeable actuator components.

AIRBORNE now offers you the advantages of modular design in rotary actuators, too

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In addition, while redesigning under the modular system, we have reduced the bulk and increased the capacity of many Airborne actuator components. You get more power in a smaller package, one that saves valuable weight and airframe space.

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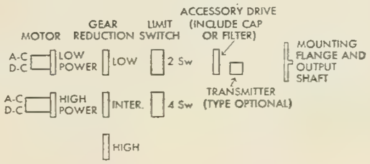
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A-C D-C
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4 Sw
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Contract Awards

with the *Polaris* missile program . . . **Geo-Science, Inc.,** Alamogordo, N. Mex., $87,879 for satellite tracking and orbit determination system . . . **Allen M. Campbell Co.,** $550,997 for ABMA vertical launching facilities, White Sands Proving Ground . . . **Western Electric Co., Inc.,** $120,830 for *Nike* spare parts and components.

Consultants and Designers, Inc., $46,000 for engineering and design services . . . **Southern Associated Engineers, Inc.,** $315,000 for engineering services . . . **Westinghouse Airbrake Co.,** $27,875 for hermetically sealed relays . . . **Firestone Tire & Rubber Co.,** $61,296 for surface-to-surface guided missile; and $48,329 for replenishment of spare parts for guided missile artillery M2 . . . **Associated Aero Science Laboratories, Inc.,** $162,567 for technical assistance . . . **Aerojet-General Corp.,** $92,338 for system equipment . . . **Gilfillan Bros., Inc.,** $29,899 for spare parts for *Corporal* missile system.

Federal Electronics Corp., $22,720 for design and development of telemetry system . . . **National Academy of Sciences,** $235,000 for research work on materials . . . **Control Data Corp.,** undesignated amount for *Bomarc* computer components . . . **Epsco, Inc.,** undesignated amount for wind tunnel instrumentation at **United Aircraft Corp.**'s research center.

Gilfillan Bros., Inc., $124,272 for *Corporal* missile parts . . . **Air Reduction Sales Co. Div. of Air Reduction Co., Inc.,** $93,350 for *Jupiter* missile welding fixture . . . **Air Logistics Corp.,** $542,344 for aircraft missile engine trailer . . . **Nuclear Products-Erco Div.,** $47,427 for research reactor study . . . **General Dynamics Corp., Convair Div.,** $1,297,340 for design, development of Azusa service, transponders . . . **Armour Research Foundation of Illinois Institute of Technology,** $120,000 for improving steel forging operations . . . **Electronic Tube Div., Westinghouse Electric Corp.,** $90,000 for developing methods for the production of fused and diffused silicon power transistors . . . **Aerojet-General Nucleonics,** $62,500 for improving neutron flux measurement.

Union Carbide Chemicals Co., Union Carbide Corp., $59,340 for special fuels for service tests . . . **Marquardt Aircraft Co.,** $27,964 for services for J43 ramjet engine . . . **Hughes Aircraft Co.,** $98,540 for research on atomic and molecular resonances . . . **Regents of the Univ. of California,** $38,700 for research on study of crossed field amplifiers . . . **Trustees of the University of Pa.,** $25,000 for research on radar environmental simulator . . . **Georgia Tech. Research Inst.,** $34,861 for services on bibliography of radar reflection characteristics . . . **Harvard College,** $28,000 for study of high-precision techniques in molecular beams . . . **G. C. Dewey & Co., Inc.,** $112,973 for research relating to zone of interior antiaircraft defense system . . . **Missileonics, Inc.,** $74,908 for decommutation system, FM telemetry . . . **Cubic Corp.,** $200,000 for increase in funds . . . **Riverside Research Lab., Div. of Motorola, Inc.,** $329,590 for passive homing drones.

Gilfillan Bros., Inc., $378,551 for *Corporal* missile system parts . . . **Douglas Aircraft Co.,** $37,092 for repair parts for *Nike* system . . . **North American Aviation, Inc.,** $176,000 for rocket engines . . . **Preshaw & Thompson, Inc.,** $164,638 for warhead tester . . . **Telecomputing Corp.,** $462,361 for warhead testers . . . **Sperry-Rand Corp., Sperry Gyroscope Co.,** $496,000 for command guidance data transponder sets for XQ-4A drones.

Thiokol Chemical Corp., $399,995 for research and development of large solid-propellant-type engines . . . **Thiokol Chemical Corp.,** $68,266 for the development of XM-10 rocket engines . . . **Board of Trustees of the Univ. of Illinois,** $33,000 for ceramic and cermet bodies . . . **Fairchild Engine Div., Fairchild Engine & Airplane Corp.,** $116,740 for research on supersonic combustion . . . **The Univ. of California,** $40,000 for research on an "experimental study of the development and stability of detonations."

The Univ. of Chicago, $65,220 for research on "semiconductors and physical electronics." . . . **The Trustees of the Univ. of Pa.,** $26,500 for research in experimental quantum electrodynamics . . . **Polytechnic Institute of Brooklyn,** $100,000 for research on "electromagnetic theory and information processes." . . . **The Johns Hopkins Univ.,** $93,147 for investigations of new particles and their interactions with nucleons . . . **Washington Univ.,** $25,288 for research concerning "problems in mathematical analysis" . . . **Mass. Institute of Technology,** $106,130 for research in heat transfer characteristics of diffusion boundary layers.

North American Aviation, Inc., $140,284 for research concerning stability and transition of the laminar boundary layer . . . **Engineering Service, Jackson, Miss.,** $66,787 for western USSR, topographic maps.

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Magnetics May Aid Return of Satellites

The new science of magneto-aerodynamics may provide the means for the safe return of artificial satellites to the earth's surface, according to an advance summary of research results in this field. Dr. William R. Sears, director of the Graduate School of Engineering at Cornell University, in a lecture at the National Academy of Sciences declared that further research in this field may also lead to a tremendous increase in the thrust of conventional rocket motors.

Magneto-aerodynamics is concerned with the partial ionization of air that occurs when objects pass through it at extremely high speeds, notably during the re-entry of rockets and satellites into the earth's atmosphere. As friction and compression heat the air in front of the object to very high temperatures, the atoms of which air is composed release free electrons and the air then becomes a conductor of electricity.

According to research at Cornell, this conductivity can be further increased by "seeding" the air near such a high-speed body with a small amount of an easily ionizable substance such as sodium or potassium. At speeds of Mach 12 to 14, a state of conductivity several times greater than salt water can thus be induced.

"If this technique can be worked out, and if magnetic field strengths comparable to those of permanent magnets can be provided in flight," said Dr. Sears, "electric currents will be set up by the motion of the air, and significant forces can be applied directly to the airstream."

In the case of a satellite re-entering the atmosphere at high speed, the electromagnetic relationships will resemble those of an electric generator. The hot, seeded air, being a conductor of electricity, takes the place of the windings of the generator armature, while the magnetic field emanating from the satellite in flight will supplant the generator's fixed field. As the satellite plunges back into the atmosphere, the moving of this hot-air "armature" across the magnetic field of the satellite will generate an electric current.

Just as torque tends to retard the armature of an operating generator, so will the air flowing past the missile tend to be decelerated. "This retarding effect," said Dr. Sears, "may prove useful in slowing down satellites to prevent their overheating as they enter the atmosphere."

Aerojet Will Add 1000 Employees by June

Aerojet-General Corp. expects to add 1000 professional and skilled workers at its Sacramento plants by June. The company currently employs about 7000 people in the Sacramento facilities where work is in progress on rocket engines for the *Titan* and *Polaris* ballistic missiles.

Mr. R. H. Stevens, manager of industrial relations, emphasized that almost all of the new openings will require professional engineers or highly skilled tradesmen. He said there will be very few jobs for untrained workers.

Mr. H. R. Todd, head of engineering placement, estimated that about one-fourth of the 1000 additional personnel will fall in the professional or college-trained class.

"We need 500 top-level scientific personnel to work in many fields including mechanical, aeronautical, electronics and chemical engineering. They will engage in research and development work on the world's most advanced rocket propulsion systems," Todd said.

Britain Developing Advanced IRBM

A White Paper on Defense released by the British Information Services disclosed the development of a British IRBM of more advanced design than the *Jupiter* or *Thor* that will be launched from "hard" bases underground. The British IRBM is reported unofficially to have a range of 2500 miles.

The announcement stated that the agreement for supplying Britain with intermediate-range ballistic missiles will be completed and published shortly.

In discussing the Russian military position and the contribution the Free World must make to offset the Russian threat the government said:

"Peace is being maintained by a balance of arms. The ultimate aim, however, must be comprehensive disarmament by all nations coupled with comprehensive inspection and control by a world authority. The West is ready to discuss proposals of all kinds with Russia, and with sincerity and perseverance agreement should not be impossible, but negotiations are bound to be protracted. Meanwhile the Free World cannot afford to lower its guard.

"Though Russia has been making great strides in the field of nuclear weapons and rockets her basic strength lies in her superiority in conventional forces; the West relies primarily upon the nuclear deterrent. Russia's successful launching of satellites has not upset the balance of military power; in fact, the overall superiority of the West is liable to increase as a consequence of the introduction of medium-range ballistic rockets.

"The protection of the Free World must be undertaken by a collective effort. Britain will continue to make her main contribution to peace through NATO, the Baghdad Pact and SEATO. An increasing degree of interdependence must be accepted.

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must be resolutely defended on the ground. The three regional defense organizations together provide this vitally necessary defensive shield, the effectiveness of which, however, depends ultimately on the fact that behind them stands the immense nuclear power of the West to which Britain is making an increasingly significant contribution, British megaton bombs are in production and deliveries to the RAF have begun.

"Progress is being made with the development of a propelled bomb. The role of Fighter Command is now limited to that of protecting the bomber bases. When the Russians can knock out our airfields with rockets, the value of fighter defense will decrease. But that point has not yet been reached."

Southwest Research Designs *Thor* Shelter

Prototypes of the launching complex shelter for *Thor* missiles are now being built by the missile engineering division of the Douglas Aircraft Company, Inc. from designs furnished by the architectural staff of Southwest Research Institute.

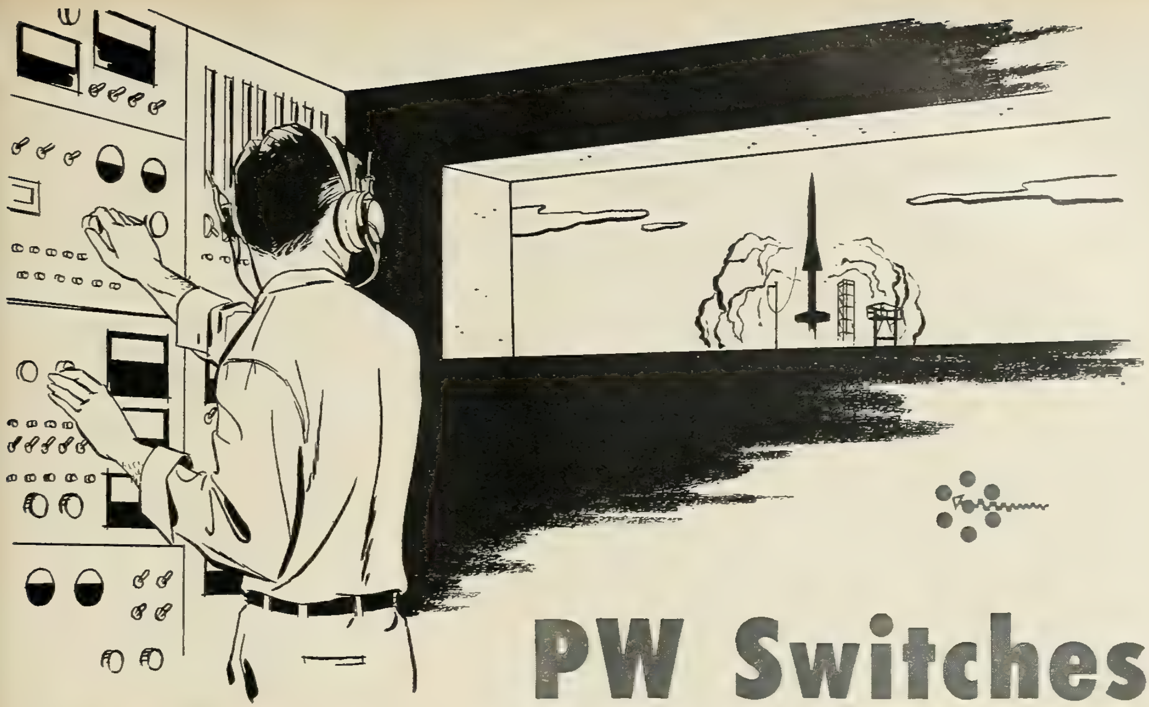
The unit is designed for sheltering the missile in either extreme heat, cold or other varying environmental conditions. The demountable structure is designed to be flown to its location with its largest component being 8 by 15 feet. It will withstand winds up to 120 miles per hour.

The shelter will cover the launching pad and the missile in a horizontal attitude to permit suitable maintenance and firing check-out operations. The front doors slide horizontally on a manual basis. The main shelter then moves over the missile by remote control. The missile is then erected on the pad by a hydraulic lift.

NACA Space Committee Holds First Meeting

The special committee on space technology of the National Advisory Committee for Aeronautics held its organization meeting in February at NACA committee headquarters, in Washington, D.C. The full 15-man membership headed by Dr. H. Guyford Stever attended. Also participating in the meeting were NACA Chairman James H. Doolittle and Dr. Hugh L. Dryden, director of the NACA.

Working groups to deal with specific aspects of space technology were set up yesterday. They and their chairmen are as follows: objectives, Dr. James A. Van Allen; vehicles,



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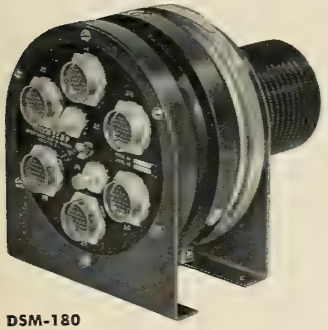

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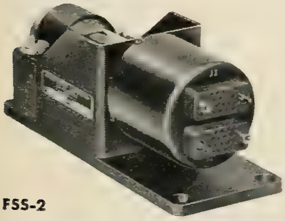

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Dr. Wernher von Braun; re-entry, Dr. Milton U. Clauser; range, launch and tracking, James R. Dempsey; instrumentation, communication and navigation, Dr. William H. Pickering; space surveillance, Dr. Hendrik W. Bode; human factors and training, Dr. W. Randolph Lovelace II.

In addition, the long-established NACA technical committees on aerodynamics, structures, propulsion, and operating problems, will be called on in connection with problems in their particular fields.

The members of the Space Technology Committee, and their affiliations are: Dr. H. Guyford Stever, associate dean of engineering, Massachusetts Institute of Technology; Chairman, H. Julian Allen, NACA Ames Aeronautical Laboratory; Col. Norman C. Appold, U.S. Air Force; Dr. Hendrik W. Bode, director of mathematical research, Bell Telephone Laboratories; Dr. Milton U. Clauser, director of aeronautical laboratory, Ramo-Wooldridge Corporation; Prof. Dale R. Corson, Cornell University; James R. Dempsey, manager, astronautics division of Convair; Robert R. Gilruth, assistant director, NACA Langley Aeronautical Laboratory; S. K. Hoffman, general manager, Rocketdyne Division of North American Aviation, Inc.; Dr. W. Randolph Lovelace II, Lovelace Clinic, Foundation for Medical Education and Research; Dr. William H. Pickering, director, Jet Propulsion Laboratory, California Institute of Technology; Dr. Louis N. Ridenour, Jr., missile systems division of Lockheed Aircraft Corp.; Abe Silverstein, associate director, NACA Lewis Flight Propulsion Laboratory; Dr. James A. Van Allen, Department of Physics, State University of Iowa, and Dr. Wernher von Braun, director, Development Operations Division, Army Ballistic Missile Agency.

Boeing Reveals Antimissile Project

Boeing's pilotless aircraft division is currently developing two new defensive missile projects at its Seattle plant. The new missiles are in addition to the IM-99 *Bomarc* now being produced as area defense weapons for the Air Force.

Lysle A. Wood, Boeing vice president and general manager of the pilotless aircraft division, said that both of the new projects are defensive weapon systems aimed at counteracting the threat of new enemy offensive weapons in the next decade, including ballistic missiles.

First of the new weapons is an advanced model of the present *Bomarc*. The second is an antiballistic missile system. The advanced *Bomarc* now is well along in its development stages. It would be able to seek out and destroy enemy aircraft and missiles of 250 to 400 miles. The new missile would provide additional depth and strength to the defensive protection supplied by manned interceptors, point defense missiles and shorter range area defense missiles. Identical in external appearance to the present *Bomarc*, the new missile, armed with a nuclear warhead, will fly above 60,000 feet at speeds up to Mach 5.

The anti-ICBM weapon was described only as a substantial research project undertaken by Boeing in conjunction with other firms long associated with the missile field. Object of the program is the development of a weapon system capable of detecting, intercepting and destroying ICBMs "so far above the earth that atomic fallout would not be a problem." Velocity of this anti-missile is expected to be above Mach 8.

"We have been engaged in the study and development of defensive

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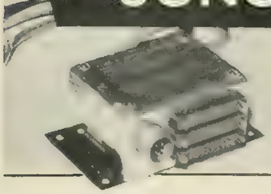

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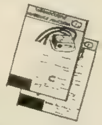

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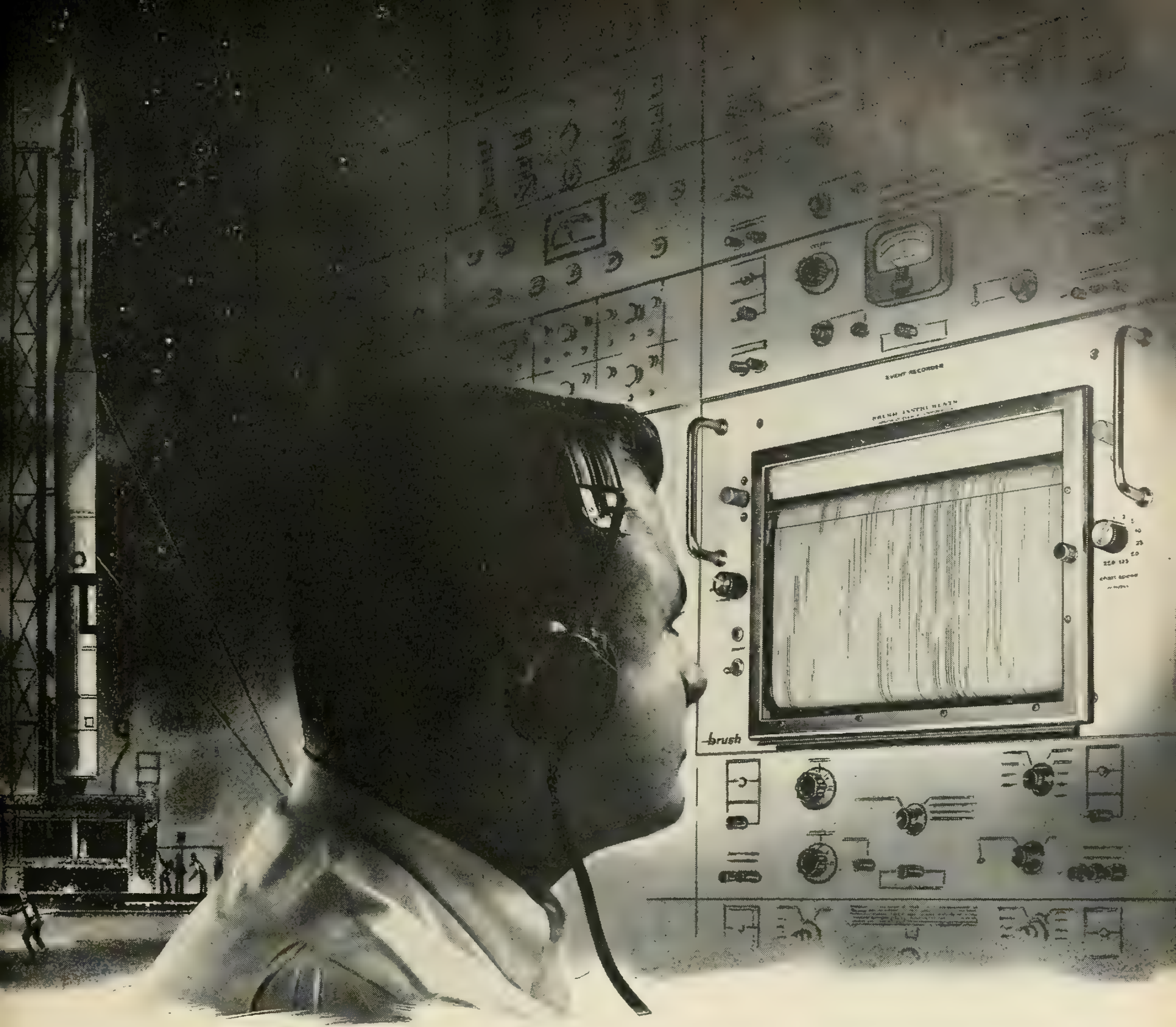

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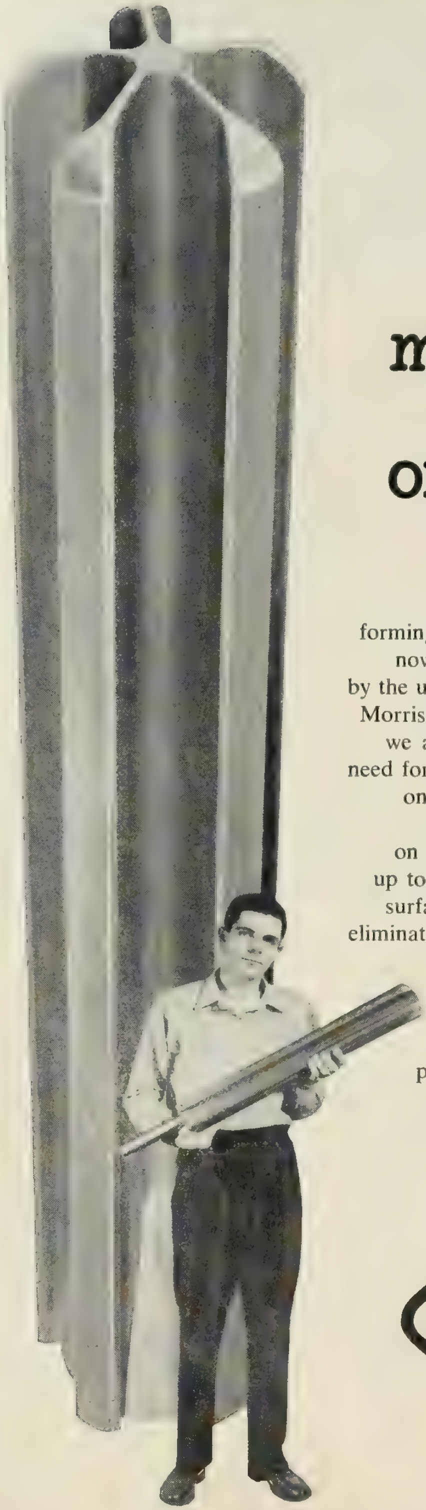

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missile systems for the U.S. Air Force since 1945," Wood said. "Our experience has convinced us that there is no sound reason why practical and effective defensive missiles cannot be developed to counter any enemy offensive missile threat whether it be via extremely fast air-breathing missiles, combinations of missiles and manned aircraft or ICBMs."

Performance differences between the present *Bomarc* and the advanced flight vehicle will be substantial, but the ground alerting, guidance and logistical portions of the advanced *Bomarc* system would be virtually identical with those of the present *Bomarc*, thus permitting standardization of ground equipment for the two weapons. The liquid-propellant rocket currently used in the *Bomarc* will be replaced with a solid-propellant motor in the advanced version.

In addition to the announced projects, Boeing is known to be working on manned boost-glide rocket bombers, a defense against this type of weapon (Russia has been developing the T-4 boost-glide rocket for many months) and an anti-anti-missile missile missile for destroying an anti-missile defense system.

Boeing's manned glide rocket concept is believed to be a delta-winged bomber with a flat underside. It would be boosted above 100 miles by a three-engine rocket stage and propelled to approximately 16,000 mph by a single rocket sustainer.

Sylvania and Army Report *Plato* Progress

Project *Plato*, the Army's anti-missile missile system has made "significant progress" in the years since its inception according to a joint report by the Army and Sylvania Electric Products, Inc. "Successful tests have been made on key components of the project," Sylvania President Don G. Mitchell said.

"The *Plato* Project, a mobile anti-missile missile system, is being designed to use the *Nike-Zeus* missile in the defense of overseas military installations of both the United States and its allies," he added.

Mr. Mitchell said that Sylvania, acting as prime contractor and weapons systems manager on the project for the Ordnance Corps, began working almost four years ago on the *Plato* system when it was generally considered to be "the impossible project." He said that in order to solve the anti-missile missile problem, "completely new approaches had to be conceived and developed, in addition to the application of some of the most advanced

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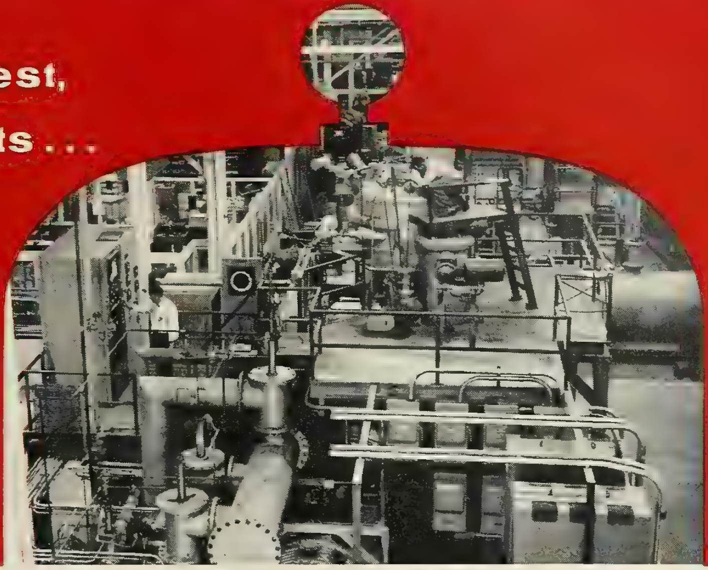

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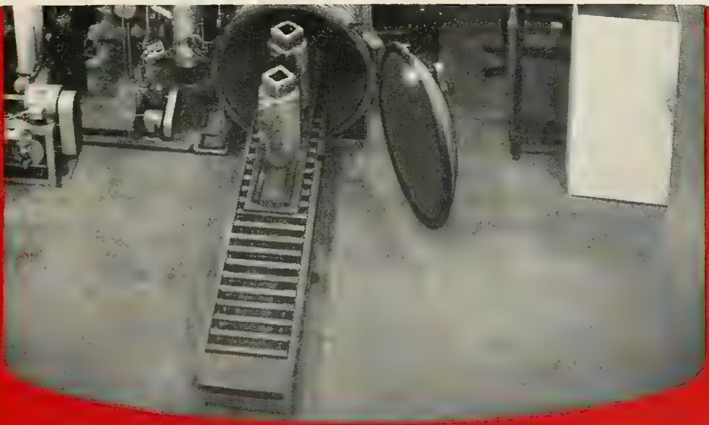

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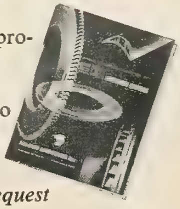

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Lt. Gen. James M. Gavin, Chief of Army Research and Development, in discussing the application of the new system, stated that "the Army is responsible for developing, procuring and operating point defense missiles to be employed against enemy piloted aircraft and missiles of all types."

The multimillion-dollar program is under the technical supervision of the Boston Ordnance District. Three other companies have participated in supplying certain specialized services to Sylvania on a subcontract basis, including Sanders Associates, General Electric Co., and American Machine and Foundry. Sylvania's missile systems laboratory was originally established in 1953 specifically to develop the *Plato* system. It became part of the Waltham Laboratories in 1955, with the completion of a 120,000-square-foot building. Construction has been completed on a new 40,000-square-foot facility for missile systems activities, adjacent to the present building.

Sylvania has also been named a major subcontractor for the development and production of a superradar system for the detection of intercontinental ballistic missiles.

Pt. Mugu to Become National Range

Guided missile range areas supporting the existing Naval Air Missile Test Center, Pt. Mugu, Calif., will be extended to form the National Pacific Missile Range. Managed by the Navy, the range will provide missile range support to adjacent military operations, including ballistic missile training launchings from Cooke Air Force Base and Pacific Fleet missile training operations.

The new range will not supplant the triservice missile test range extending southeast from Cape Canaveral, Fla. The two ranges are complementary. For ballistic missiles the Pacific range will support training operations while Canaveral will continue to specialize in research and development support.

The Pacific range will extend along the Pacific Coast approximately 500 miles and 250 miles seaward and be supplemented by test corridors in support of ballistic missile training launchings from Pacific Coast locations to impact areas thousands of miles seaward. Test intercept for aerial targets and impact will be limited to areas free from ship and air traffic.

The new range will be equipped gradually over the next few years to support test and training operations of conventional guided missiles and the training operations of ballistic missiles (IRBMs and ICBMs).

Stavid Awarded Contract for *Regulus* Guidance

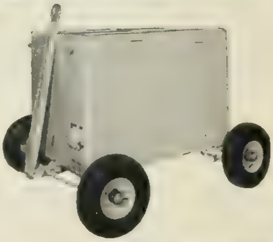
Stavid Engineering, Incorporated has received a multimillion-dollar contract to produce additional guidance systems for the submarine-launched *Regulus* missile.

The company is prime contractor for the development and production of the submarine command guidance systems used on *Regulus* I and II. It also has responsibility for maintenance of the guidance equipment with the Fleet.

Field Service Training Under Way for *Bomarc*

As the Boeing IM-99 *Bomarc* weapon system approaches operational status, major attention is being focused on the pilotless aircraft division field service program which may become the largest ever undertaken by the company, it was reported recently by James Lucas, division service manager.

Field service engineers are now in training for assignment later this



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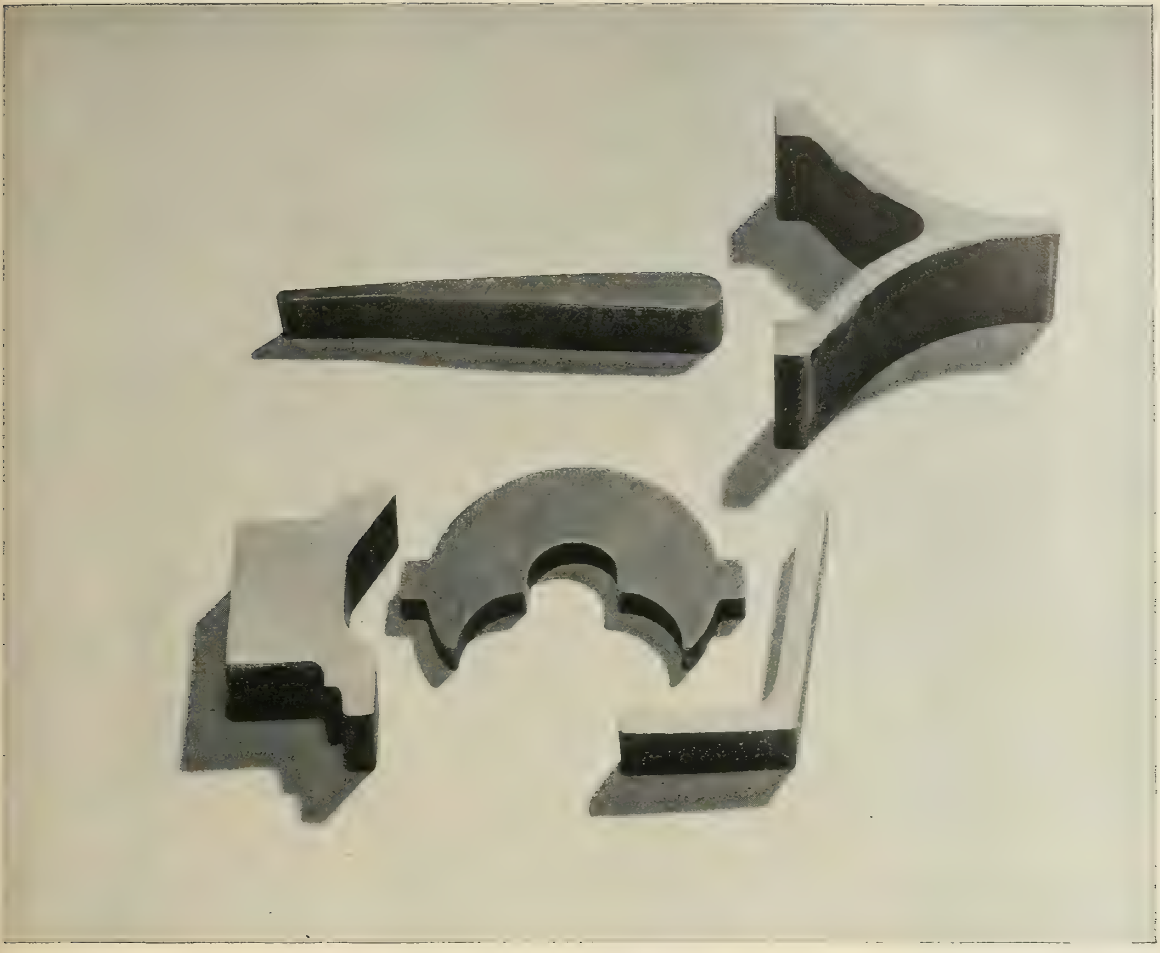

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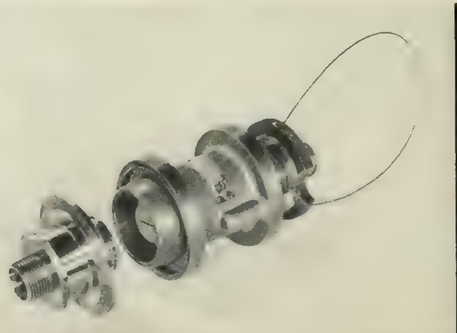

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year to assist the Air Force in operating and maintaining the first *Bomarc* site near Eglin Air Force Base, Fla.

By the end of 1958, about 15 field service engineers will be on assignment as *Bomarc* technical representatives at various locations, with a substantial additional number in training for future assignments and field service support functions.

Approximately five months of the training will be spent in the *Bomarc* training school on Harbor Island in Seattle with the remainder to be on "productive job assignments" at Boeing "according to the needs of the individual."

As each *Bomarc* base is readied for operation, a "special implementation" team of field service engineers will be assigned to assist the Air Force. After the base becomes operational, the special team will move on to another *Bomarc* base, leaving two field service engineers who will remain at the base for an extended assignment.

Kearfott Adds Astronautics Lab.

Kearfott Co., Inc., Little Falls, N.J., designers and producers of flight inertial guidance equipment, recently established an astronautics laboratory within the company's navigation projects department.

This new laboratory will be responsible for the design and development of advance systems, subsystems and components for the guidance and control of satellites and space vehicles. It will draw on a decade of experience and background in terms of proven approaches and will anticipate, in view of this entirely new environment, the requirements for hardware of sufficient accuracy and long-term performance to meet the problems posed by space travel.

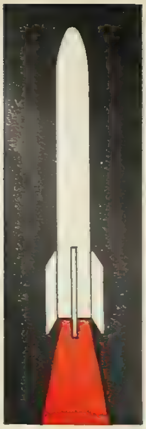
Will the Human Pilot Become Obsolete?

Methods of applying lessons learned from rocketry to civilian aircraft will be one topic of a special conference of the American Society of Mechanical Engineers, to be held in Dallas, Tex., March 16-20.

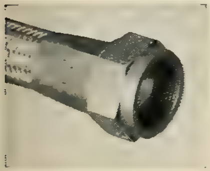
The joint aviation conference of The American Society of Mechanical Engineers and its affiliate, the American Rocket Society, will consider such topics as whether human pilots will become obsolete, how to keep pilot and passengers comfortably cool in aircraft speeding through the thermal barrier, the use of special high-energy fuels in passenger planes, guided missile instrumentation and lunar colonization.

Water is sprayed over protective clothing of engineers to wash away residue as they load fuel into rocket. Transfer line is Aeroquip 610 KEL-F Hose.

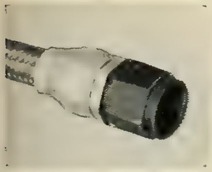
problem:
transfer of dangerous nitric acid during missile fueling operations



Aeroquip Solved it with Corrosion-Resistant KEL-F Hose



610 Hose Lines of KEL-F* for nitric acid transfer.



Hose Lines of TEFLON** for fuel and oxidizer supply lines.

Through the development of 610 KEL-F Hose for safe transfer of nitric acid, Aeroquip again demonstrated its ability to meet the wide range of fluid line requirements in the missile industry. 610 KEL-F Hose is but one of many new Aeroquip products designed for specific missile applications.

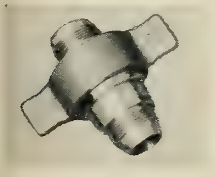
Years of experience in the aircraft and missile fields helps Aeroquip recognize, even anticipate, plumbing problems. Extensive research, development and engineering facilities, plus highly qualified personnel, assure solutions to even the most extreme fluid line problems.

Engineering assistance is available. Mail coupon below for complete information.

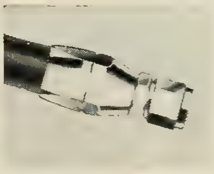
Aeroquip
REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN
AEROQUIP CORPORATION, WESTERN DIVISION, BURBANK, CALIFORNIA
AEROQUIP (CANADA) LTD., TORONTO 19, ONTARIO
AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A., CANADA AND ABROAD.

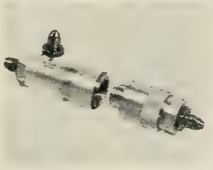
* M. W. Kellogg trade name for fluorocarbon polymers ** Du Pont trade name for its tetrafluoroethylene resin



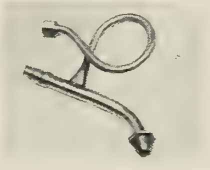
Corrosive Fluids Coupling for nitric acid, hydrogen peroxide and other hazardous fluids.



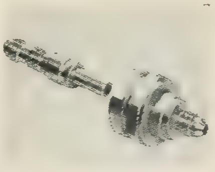
Aeroquip 659 high pressure Pneumatic Hose for air and gaseous nitrogen, helium and oxygen.



Pneumatic Check-Out Valve for missiles, with quick attaching hose coupling.



Tubing and Special Fittings for Missiles. Stainless steel, aluminum, titanium and other materials.



Pneumatic Connectors for quick-connecting bulkhead or cluster-mounted breakaway connections.

AEROQUIP CORPORATION, JACKSON, MICHIGAN **PLEASE SEND INFORMATION ON THE FOLLOWING AEROQUIP PRODUCTS:** MR-3

☐ **610 Hose Lines of KEL-F for nitric acid transfer lines**
☐ **Hose Lines of TEFLON for fuel and oxidizer supply lines**
☐ **Corrosive Fluid Self-Sealing Couplings.**
☐ **659 High Pressure Pneumatic Hose**
☐ **Pneumatic Checkout Valve**
☐ **Precision Tube Assemblies**
☐ **Pneumatic Bulkhead Connector**

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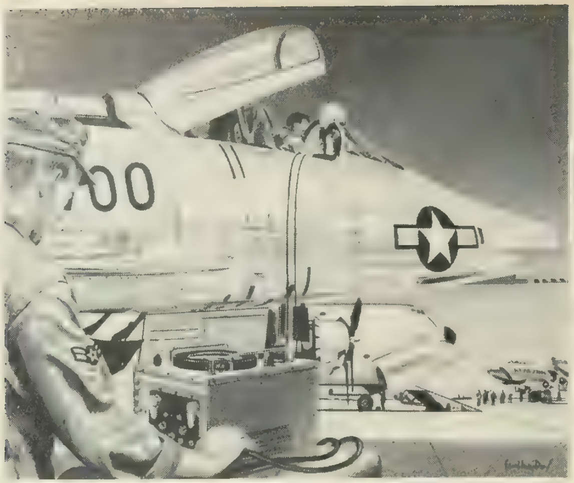
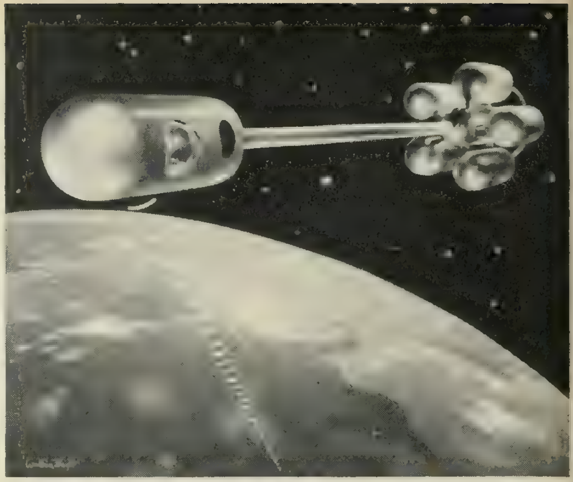


TEST INSTRUMENTS Bulova's rugged Tachometer Tester for all jet and reciprocating systems meets MIL-T-945A requirements—is accurate to 0.1% with engines on or off. Simple to operate and maintain, this field unit also serves in maintenance depots. Precise Bulova testers include the dual purpose Torqmeter—a dynamometer or calibrated torque source



RECONNAISSANCE SYSTEMS Bulova-developed miniaturized sensor packages, geared to specific tactical missions, feed combat surveillance data to Bulova analysis and display systems. Camera, infra-red, TV and radar techniques, combined and integrated, aid decision-making on land and in space. Satellite applications? Unlimited!

Bulova's capability helps to solve today's most challenging problems

To conceive, develop and manufacture a broad range of advanced electronic and electro-mechanical devices... this is the Bulova capability.

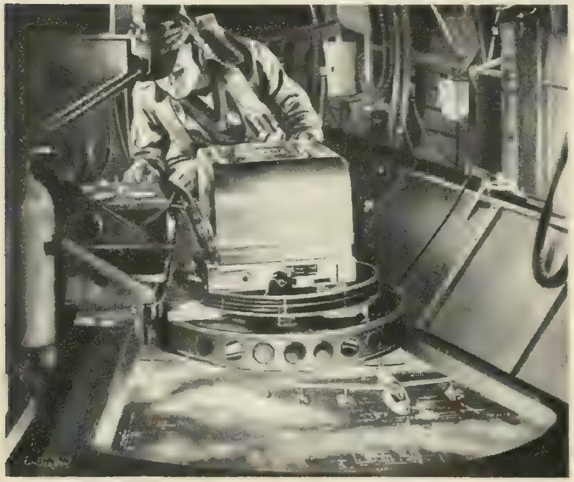
Meeting the needs of defense and industry is an unusually creative group of scientists, engineers and technicians, backed by 80 years' experience in precision production.

With dynamic imagination, Bulova's capability has invaded the often uncharted technological areas to originate many modern-day miracles in miniaturized systems and components.

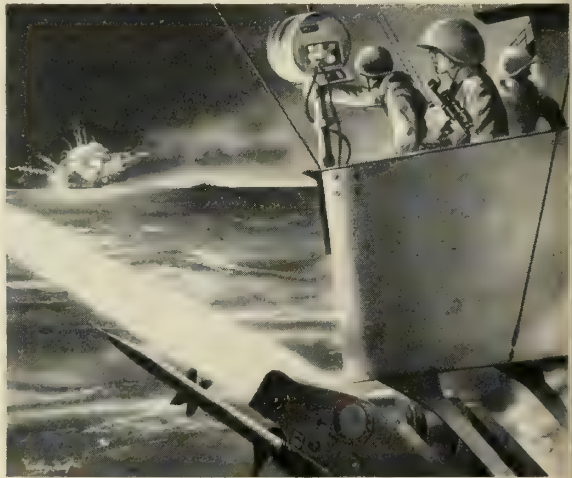
Here is a proven capability ready to assist you from concept to mass production. For full information, write Department G.I.S.-2.

BULOVA
watch company

BULOVA RESEARCH AND DEVELOPMENT LABORATORIES, INC.
BULOVA PARK — JACKSON HEIGHTS — NEW YORK



INFRA-RED COMPONENTS Bulova's advanced IR projects include mosaic cells that will automatically filter out unwanted wave lengths and picture targets clearly against any background. Bulova infra-red R&D covers lead selenide and lead sulfide cells, missile seeker cells, reticles, filters and thermistor bolometers... for defense and industry.



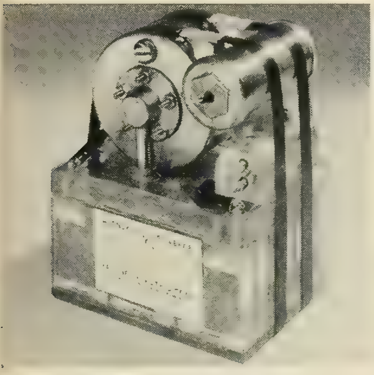
INFRA-RED SYSTEMS Bulova's IR illuminators put unseen spotlights on night objectives. Bulova's development capability extends to fire control systems that detect, track and automatically lock on target. Designed for accuracy and simplicity, these high resolution units will serve our nation's land, sea and air forces.

Circle No. 61 on Subscriber Service Card.

NEW MISSILE PRODUCTS

AUTOMATIC ACTIVATION

Yardney Electric Corp. has developed a new high-speed method of automatic activation which features an efficiency ratio allowing complete interchangeability between Yardney Silvercel primary and secondary batteries. The process also allows Yardney batteries to be activated and operated in any position. Automatically activated primaries can be made equivalent to secondaries in power rating, weight and size, and secondaries may be used for exercise and test runs. Simultaneously, equivalent primaries may be utilized for tactical end use.



Now used in Silvercel primaries, the new method replaces the slower mechanical activation process, which depended on gravity and required that liquid primary cells remain in an upright position. Activation may now be accomplished in seconds, and the battery is then ready to provide 100% power.

The activation mechanism consists of three parts that may be placed in whatever position will best fit space requirements. Illustrated is an ICBM battery weighing 10 lbs. and using the automatic activation process. When a spring-loaded plunger is triggered, it breaks a gas tank seal. The gas inflates a bladder at one end of a hermetically sealed electrolyte cylinder and the electrolyte operates a snap valve at the opposite end. The electrolyte is forced into the feed tube to the manifold, where it is evenly distributed through feed holes into the individual cells.

Special vents permit the escape of surplus electrolyte, gas and vapors through a return manifold into a sump. Since the electrolyte is originally in a separate container, and it is not in contact with the electrodes until the battery is activated, the Yardney Silvercel primary may be stored in the dry state for long periods.

Circle No. 225 on Subscriber Service Card.

ELECTRONIC FILTER

A dual unit, direct coupled, electronic highpass/lowpass filter is now available from Spectrum Instruments, Inc. Model LH-24D is designed for installation in standard 19" rack or table cabinet and offered for a variety of applications demanding availability of response to dc, or zero frequency.

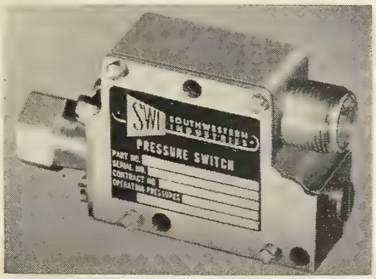
The two individual filter units are identical and may be converted from highpass to lowpass, or vice versa, by manipulation of a panel selector switch. The units may be used as independent filters or interconnected to secure bandpass, bandstop, or highpass/lowpass operation with doubly steep rate of cut-off. The individual section cut-off frequency is continuously adjustable over five decades extending from 0.2 to 20,000 cycles/sec.

Circle No. 226 on Subscriber Service Card.

MINIATURIZED PRESSURE SWITCHES

A series of miniaturized, lightweight, high-pressure, vibration-damped pressure switches for missile applications has been developed by Southwestern Industries, Inc. Weighing approximately 0.4 lb. the series PS 3800 switches operate in inert gases and fuels, engine and hydraulic oils and aromatic fuels and are designed to withstand vibrations up to 25g's, from 10 to 2000 cps. Small and compact, they are flush-mounted and allow installation in applications where sensitive response must be accomplished under conditions of extreme vibration.

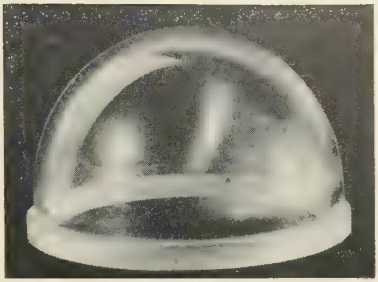
Because the pressure switches are externally adjustable, they can be readjusted through their actuation pressure range as required by the installation. The PS 3800 series is available in actuation pressure ranges from 400-2000 psig (proof pressure 4000 psig) or 2000-3500 psig (proof pressure 5000 psig). Actuation to deactuation maximum differential pressure is 250 to 350 psi. Operating temperatures range from –40° to +160°F.



Circle No. 227 on Subscriber Service Card.

INFRARED DOMES

A new method of producing infrared protective domes has been developed by Precision Lapping Co., Inc. The irdomes can be obtained with spherical curvatures ranging from a slight meniscus to considerably more than a hemisphere, and in aspheric shapes. Physical dimensions are controlled during manufacture to achieve extremely close tolerances. After final grinding and polishing, spherical tolerances are held to millionths of an inch, diameters to ten thousandths, and concentricity between inner and outer surfaces within ten thousandths.

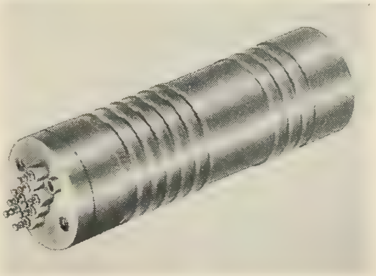


Dome materials may be specified according to user requirements of band spectrum, thermal shock resistance, abrasion resistance strength, and diameter needed. Quick deliveries can be made on domes of quartz, silicon, calcium aluminate, sapphire, arsenic, trisulphide, germanium, glass or metal. Sizes range from 1" to 72" in diameter, with integral flanges if desired. When dome must be larger than material available, *i.e.*, sapphire, small sections can be bonded or fused together to form the blank.

Circle No. 228 on Subscriber Service Card.

MAGNETIC AMPLIFIER

The 100C series, low-level DC magnetic amplifier developed by California Magnetic Control Corp. has been designed for a wide range of applications in electronic and electrical control systems where light weight, minimum bulk and high reliability are important factors. Its characteristics make it adaptable for use in missiles, atomic reactor control circuits, and in industrial control equipment.



This low-level DC amplifier weighing only 6 oz. and occupying about 6 cu. in. of space, has a significantly higher degree of reliability than vacuum tube and transistor amplifiers of much greater size and weight. It is polarity sensitive, and

can you
use this
seal?

Need to seal these
temperatures?
Then you should
find out about . . . **Met-O-Seal**

MET-O-SEAL was developed by the Franklin C. Wolfe Company to provide a practical answer to *no-leakage* sealing at extreme temperatu
Here are just some of the advantages obtainable:

- Lower machining costs
- Less flange weight
- Can not blow out
- No loss of structural strength
- No leakage!

If you design in these temperature ranges why not find out about MET-O-SEAL, one of the pr members of the Gask-O-Seal Family?
New literature NOW available upon request. Write For Free Copy.

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is intrinsically stable, having stability comparable with chopper stabilized amplifier systems.

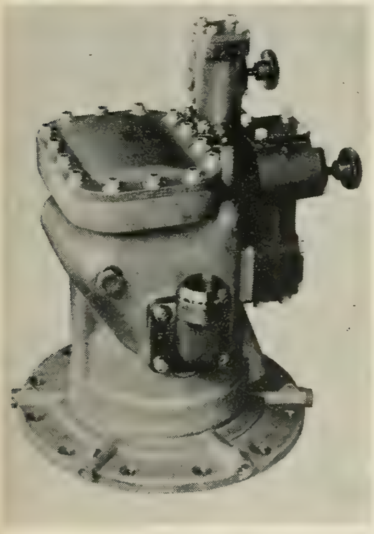
The 100C amplifier is supplied in gains of 500 and 1000 with linearity of 1/10 of 1%. Gain stability with variations in line voltage of plus or minus 10% and frequency of plus or minus 5% is kept to plus or minus 1%. Output voltage range of the instrument is plus or minus 28 VDC. Response time of the unit is 0.02 second.

Circle No. 229 on Subscriber Service Card.

HYDRAULIC PUMP

A new variable delivery, variable pressure, hydraulic pump capable of pressures to 5000 psi has been announced by Vickers Inc. The pump has passed an Air Force 1000-hour qualification test (MIL-S-26874 and 26877) requiring operation at 5000 psi for more than 10% of the test time. During the test, the unit completed in excess of 23,000 duty cycles from zero flow to full flow.

The pump is designed to deliver 38.2 gpm at 3750 rpm and 3000 psi. Minimum life for steady-state operation at this pressure and flow is approximately 1335 hours. At 5000 psi and 3750 rpm, delivery is about 38.2 gpm with minimum life of approximately 288 hours. Vickers reports very low internal pump leakage with high overall reliability as standard design components with proven long service records are used.



This new 5000 psi pump was designed for hydraulic test stand use, missile launching, jet engine starters, checkout stands, and mobile shop equipment that can advantageously utilize the high reserve power feature of the pump.

Circle No. 230 on Subscriber Service Card.

COMMUTATOR SWITCH

Bendix Aviation Corp. has developed a complete line of newly designed, long-life commutator switches. The motor-driven units are used in telemetering, sampling and programming applications.

Especially designed for 500 hours minimum operation, and for switching of high and low impedance circuits in aircraft and missile applications, the com-

ONE OF THESE 4 PACIFIC

Accelerometers

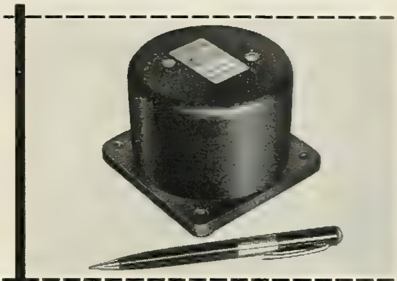
CAN PROVIDE RELIABLE ACCELERATION MEASUREMENT FOR YOUR OWN NEEDS!

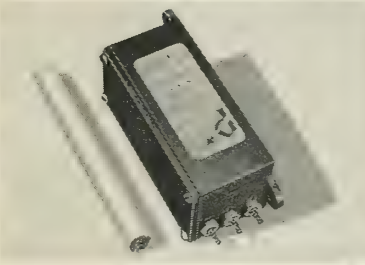
Four basic Pacific Accelerometer types — already designed and developed — can be used to meet practically any acceleration measurement requirement! Send for complete data sheets!

HIGH ACCURACY POT

Single or dual potentiometer pick-off and/or switches . . . automatic caging mechanism. A unique torsion-bar suspension and restraining system provides very low hysteresis with exceptionally rugged, long life. Available in a wide variety of G ranges.

SERIES 4202





LIGHTWEIGHT, MINIATURE

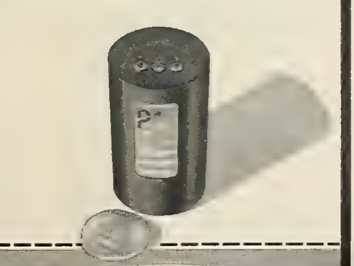
accelerometer combines a wide flexibility of design and performance characteristics with a proven, high production instrument. Potentiometer pick-off... wide selection of G ranges with an operating range of 0—±1 G to 0—±50 G.

SERIES 4201

HIGH ACCURACY AC OUTPUT

linear accelerometer designed for high response systems requiring AC signal. This unit provides an accurate, large output AC signal while maintaining a high natural frequency and low cross talk. Temperature compensated fluid damping provides exceptional dynamic characteristics *without* heater.

SERIES 4204



NO CROSS TALK

due to uni-directional design this instrument measures acceleration in one direction only, and cannot produce any output signal from cross accelerations. Pot pick-off . . . available in a choice of many G ranges.

SERIES 4203

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At Raytheon, hundreds of subminiature tubes are checked each day by an automatic X-ray process. Microscopic welds and spacing of elements are scrutinized to help assure reliable operation even under the most critical conditions.

Excellence in Electronics

RAYTHEON

This is only one example of the rigorous inspection and testing techniques that have earned for Raytheon components and systems a reputation for the utmost in reliability.

RAYTHEON MANUFACTURING COMPANY, WALTHAM 54, MASS.

mutators are available in a wide selection of poles and positions, and in speeds from 1/8 to 30 rps.

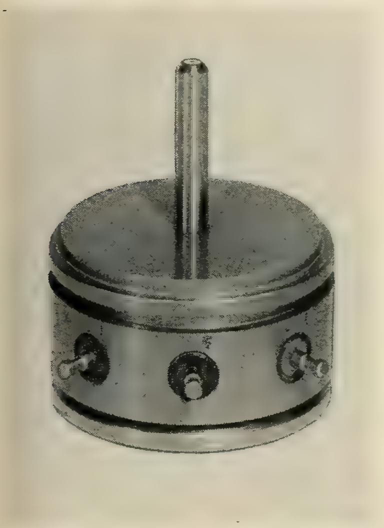
Circuits available are two independent switch sections per commutator on the model TSC-50, and three independent switch sections on the model TSC-51. Drive motors are available for operation on 115v, 400 cycles AC or 26.5v DC.

Rated performance is achieved at temperatures to 85°C and vibration of 25g to 2000 cps. Weight is less than 2 lbs., and power requirements are 10 to 20 watts, depending on speed and number of poles.

Circle No. 231 on Subscriber Service Card.

METAL FILM POTENTIOMETERS

A new type of metal film precision potentiometer is now being manufactured by the Magnetics Division of Servomechanisms, Inc. The resistance element of the potentiometer is made of alloys developed for this purpose, evaporated in high vacuum and deposited onto a ceramic disc. The process involves the carefully controlled transfer of the metal in its vaporized state to build up coatings of desired shape on the prepared surface of the ceramic base or "substrate." Thickness of the coatings can be controlled to produce accurately the desired electrical characteristics. The entire process can be accomplished by the use of fully automatic equipment.



Made entirely of inorganic materials —ceramic and metal held together by molecular bond—the rugged construction enables the unit to withstand extreme tests of vibration, shock and humidity. Tests conducted to date indicate superior performance and dependability at temperatures of 150°C and higher.

The uniformly deposited resistance element offers substantially infinite resolution together with low noise and relatively small contact and end resistance, eliminating the problem of "hunting" in high-performance servo loops. Together with the patented contact brush, it assures long rotational life and continued low noise level. Although power rating is generally stated at 2 watts (with temperature of 150°C), both the brush and the resistance element are capable of dis-

New Books on

ROCKETS AND MISSILES

EXTERIOR BALLISTICS OF ROCKETS

By Leverett Davis, Jr., California Institute of Technology; James W. Follin, Jr., Applied Physics Laboratory, The Johns Hopkins University; and Leon Blitzer, University of Arizona

This book develops the basic theory of exterior ballistics of both spin- and fin-stabilized rockets, emphasizing both the physical understanding of rocket behavior and its mathematical description. Based on the efforts of many dedicated individuals, through successive versions and stages of security classification, this useful volume now brings to all those desiring a familiarity with the science of rocket ballistics an essential foundation upon which to build the skills required for more advanced work today. **458 pages, $8.50**

MISSILE ENGINEERING HANDBOOK

By C. W. Besserer, Technical Staff, Ramo-Wooldridge Corporation

This fourth volume in the series PRINCIPLES OF GUIDED MISSILE DESIGN brings together important handbook data and a glossary of guided missile and space flight terms—useful for reference and for preliminary design, parametric studies and instruction. For all figures and charts, the book explains limits of accuracy and range of application for maximum practical usefulness. Like its predecessors in the series, this volume has been prepared to provide engineers, designers and technicians with a thorough grounding in the technology of guided missiles. **608 pages, $12.50**

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Research as a decision-making tool; armament for target destruction; and launching design as a method of achieving initial flight. **$12.50**

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One tape can't serve all recording needs in magnetic instrumentation

There are differences between pulse and carrier recording . . . therefore the tapes used in these systems must have different characteristics. Only in Soundcraft Instrumentation Tapes are these distinct and separate properties engineered into the oxide formulation. Soundcraft then adds two original processes — Uni-Level Coating and Micropolishing — to achieve the surface perfection found exclusively in the most advanced tapes of our time:

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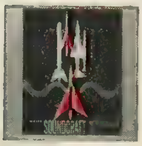
Get the Soundcraft Tape that's made for your application . . . get error-free recording!

RCCH oxide formulation gives "Type A" higher signal output and greater retentivity plus unique surface hardness for controlled tape wear rather than uncontrolled equipment wear.



The special FM formulation in "Type B" is a highly refined form of gamma Fe_2O_3 oxide with high temperature binders, lubricants and anti-static agents to assure uniform speed and tape-to-head-contact — preventing flutter.

R14

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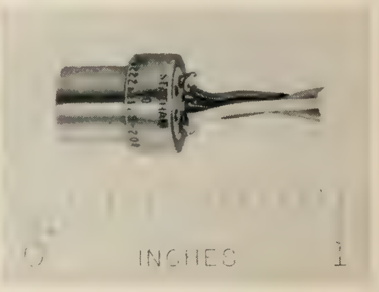
sipating considerably higher wattages. The mechanical design of these metal film potentiometers permits ganging and phasing of 2 or more independent sections on a common shaft.

Circle No. 232 on Subscriber Service Card.

PRESSURE TRANSDUCER

A tiny flush-diaphragm pressure transducer approximately 1/8 the size of miniature instruments now in use has been developed by Statham Instruments, Inc. The unit has a diameter of 0.25", measures 0.47" in length and weighs 3 grams.



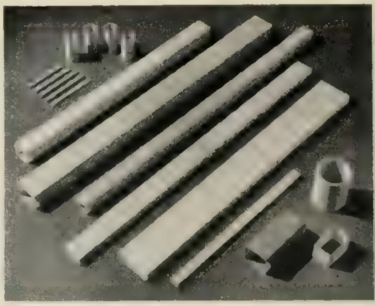
Due to the small dimensions, the model P222 pressure transducer is adaptable to many application possibilities in which the measurement of gage differential and absolute pressures are required.

Using the principle of the unbonded strain gage, the circuit of this subminiature instrument forms a complete bridge with a nominal resistance of 200 ohms. It has an output of approximately 15 millivolts full-scale open-circuit at 3 volts excitation. The wide ambient temperature limits of –100° to +275°F and the availability of pressure adapters for conversion to closed line applications extend the potential use of the instrument.

Circle No. 233 on Subscriber Service Card.

HIGH-TEMPERATURE CORE TUBES

Silicone Insulation, Inc., has developed new equipment producing rectangular and round high-temperature core tubes with a minimum of tooling costs. Class "H" tubes are of laminated silicone glass cloth. They are designed to meet the requirements of military specifications MIL-E-917B for electrical power equipment and MIL-E-16400A for electronic equipment. Class "B" tubes are of laminated polyester glass cloth or laminated epoxy glass cloth.

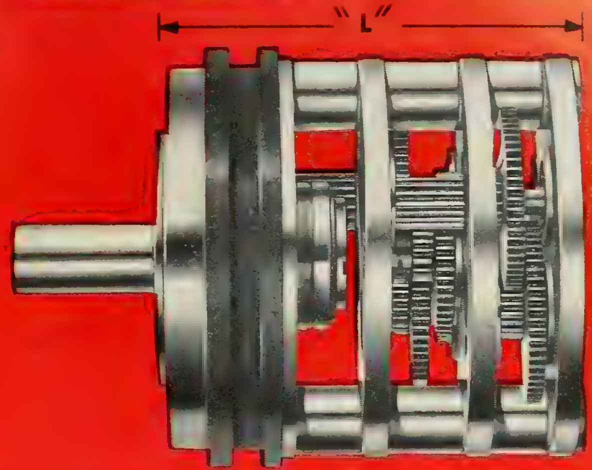


Semistandard sizes comprise rectangular tubes with both internal dimensions between ¼" and 2" and round tubes with internal diameters between ¼" and 2". The nominal wall thickness of these tubes

EDISON

PRECISION GEAR HEADS

- **Sizes 8 through 18 available in any ratio within 1%.**
- **Mount directly on all Edison and Bureau of Ordnance Motors without adapters.**



- **Adapters available to mount on any motor.**

CHARACTERISTICS	STANDARD EDISON GEAR HEADS							
Size	8		10		11	15		18
Part Number								
Pinion Data:								
Number of Teeth	12		13		13	15		15
Diametral Pitch	120		120		120	96		96
Pressure Angle	20°		20°		20°	20°		20°
Pitch Diameter	.1050″ +.0 −.0005		.1083″ +.0 −.0005		.1083″ +.0 −.0005	.1562″ +.0 −.0005		.1562″ +.0 −.0005
Gear Ratio to Length "L"	Ratio	"L"	Ratio	"L"	Ratio	Ratio	"L"	Ratio
	17	0.750	31	0.781	36	40	0.812	60
	42	0.812	93	0.954	108	140	1.000	240
	104	1.008	280	1.054	324	490	1.100	960
	253	1.070	840	1.116	972	1715	1.162	3840
	615	1.204	2521	1.266	2916	6000	1.328	15,360
	1494	1.347	7565	1.409	8748	21,000	1.487	61,440
	3629	1.421	22,696	1.500	26,244	73,500	1.600	245,760
Moment of Inertia GM CM²	.01		.018		.02	.05		.08
Maximum Running Torque in. oz.	15		15		20	25		25
Maximum Stall Torque in. oz.	35		35		40	50		50
Breakdown Torque in. oz.	.01		.01		.012	.015		.018
Backlash maximum	30′		30′		30′	30′		30′

Gear Tolerances: Precision Class 2 AGMA 236.02. *Bearings:* Stainless Steel ABEC Class 5 or better. *Shaft Radial Play:* .002″/inch length max. with 4 ounce gage load. *Shaft End Play:* .002″ max. with 1 pound gage load. Friction Slip Clutch available on request. Designed to meet applicable paragraphs of MIL-E-5272.

Thomas A. Edison Industries
INSTRUMENT DIVISION
85 LAKESIDE AVENUE, WEST ORANGE, N. J.

McGRAW EDISON

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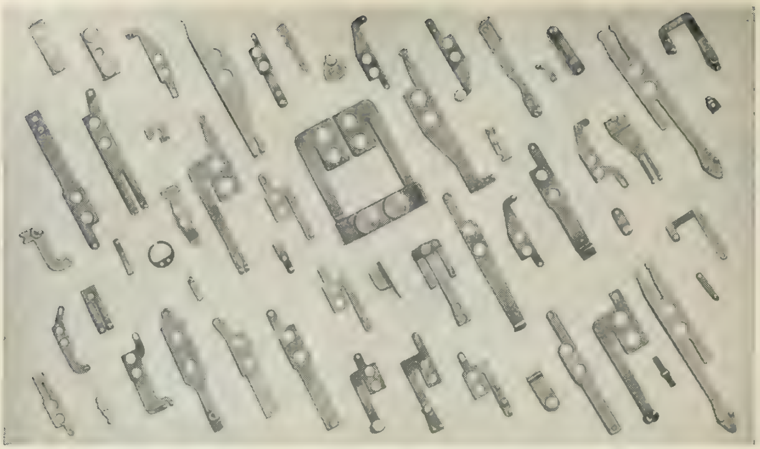

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8008 South Wallace Street • Chicago 20, Illinois

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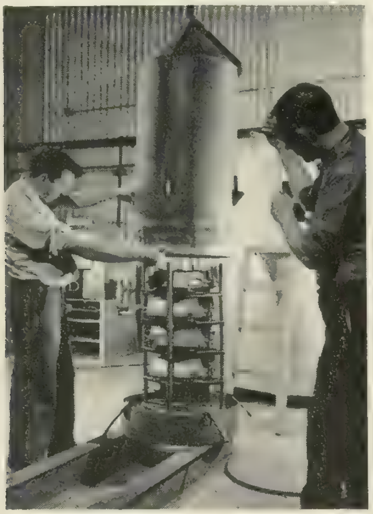

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Whatever your problem may be, our engineering, development and production facilities are at your disposal. Write, wire or phone for information.

STALKER
DEVELOPMENT COMPANY
905 Woodside Avenue
Essexville, Michigan

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is .030" and the standard length 25".

The new equipment can also turn out nonstandard sizes of tubes with heavier or lighter walls and lengths up to 72", as well as tubes with special contours. Special tooling has recently turned out tubes ranging from 20" I.D. x 144" length x 3/8" wall to one with a wall of .004".

Any of the tubes can be cut to specified lengths or fabricated with holes, grooves, or slots. Terminals and other hardware can be attached or markings applied. Laminated silicone glass cloth parts made by the company have been tested at 700°F for 300 hours and even higher temperatures and found satisfactory for their applications.

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PRECISION ACCELEROMETER

A completely transistorized precision linear servo accelerometer, Model 4310, has been introduced by Donner Scientific Co. The unit is available in ranges from ± 0.05 g to ± 50 g. The maximum output is either ± 7.5 or ± 1.5 ma, eliminating auxiliary amplifiers required by other types of accelerometers. The Model 4310 is portable and can be operated from a simple battery power supply providing ± 15 v at 6 ma. Repeatability is 0.01% of full-scale and linearity is within 0.05% of full-scale. The entire unit weighs only 3.2 oz. When weight and space requirements are even more critical the acceleration pickup portion can be separated from the servo-amplifier part of the instrument and installed in a remote location.

DONNER
ACCELEROMETER
MODEL 4310
±8G
SER.NO.102
1
2
3

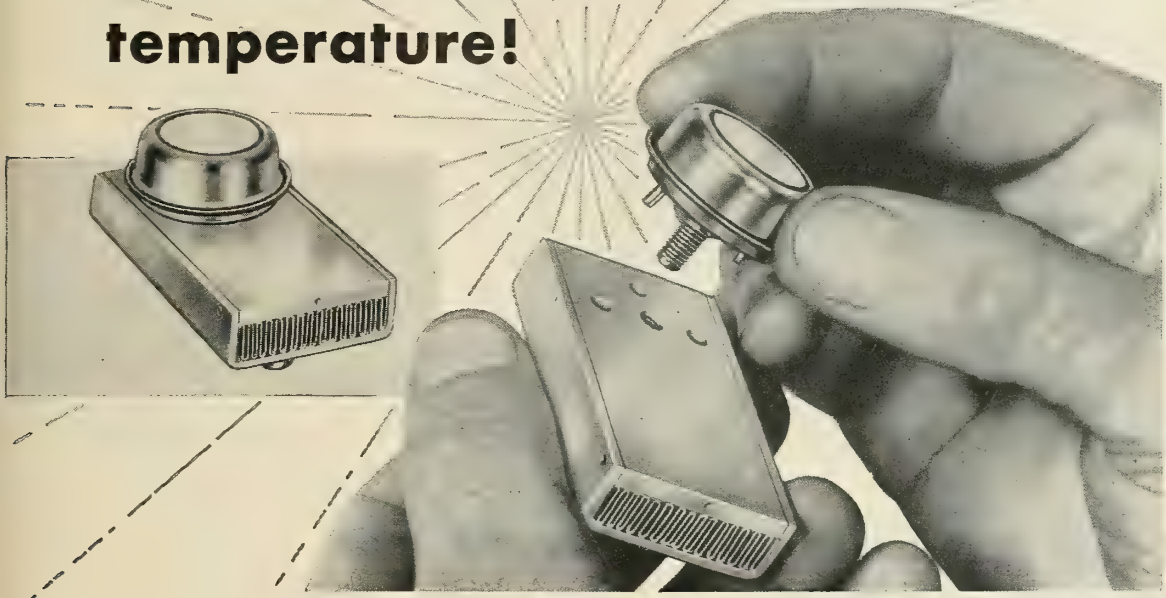
Circle No. 235 on Subscriber Service Card.

COUNTER-TIMER

Systron Corporation has introduced a single package in-line megacycle-microsecond counter-timer in its Model 1031, now in production. Providing flexibility and reliability for laboratory applications, it measures: frequency to 1 mc, time and period in 1 microsecond increments, phase angles in 0.1° increments, events to 7 digits, ratio of 2 frequencies, and acts as a secondary frequency standard.

The principal feature of the equipment is the in-line display of informa-

UAP COLD PLATE controls TRANSISTOR junction temperature!



minimizes transistor derating for thermal conditions . . .

UAP cold plate U-521330, designed for Collins Radio Company, dissipates heat generated by power transistors used in ground and airborne electronic circuits. The heat is transferred across a pressure thermal contact to cooling air. The cold plate controls the transistor junction temperature within operating limits compatible with the installation. Therefore, transistor derating is minimized.

The cooling air, which is forced through the cold plate, can be ducted from an air cycle refrigeration system; a ram air supply; an air manifold within the electronic compartment or a pressurized equipment package.

The aluminum cold plates are bonded by UAP's dip braze method which produces extremely lightweight assemblies with maximum heat transfer area within the core. Cold plates can be used individually or assembled in manifolded banks.

DESIGN PERFORMANCE CHARACTERISTICS OF U-521330 COLD PLATE

Air flow: 7 lbs. per hr.
Air pressure drop: 0.25" H_2O corrected to .0765 density
Temperature drop in cold plate: 1.5°C per watt dissipated
Weight: Approximately 1 oz.
Performance characteristics can be modified to requirements.

For complete information call the nearest UAP Contractual Engineering Office

CALIFORNIA....................1101 Chestnut St., Burbank Calif., VI 9-4236
NEW YORK.................50 E. 42nd St., New York 17, N. Y., MU 7-1283
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CANADA..............United Aircraft Products, Ltd., 5257 Queen Mary Road,
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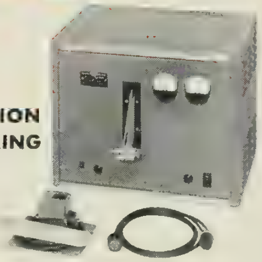

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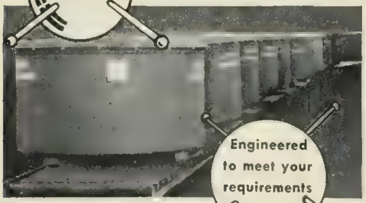

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tion. The well-illuminated 1"-high numerals are clearly readable at distances up to 30 or 40 ft.

Outstanding features include: remote in-line indication, the use of the Burroughs beam-switching tubes for the counting decades with corresponding reduction of conventional vacuum tubes, and modular construction for all amplifiers and control circuitry.

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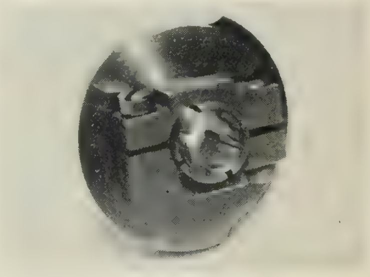
ADJUSTABLE CAM ASSEMBLY

Sterling Precision Corp. has developed an adjustable cam assembly designed for use in servomechanisms where it is desired to actuate switches and similar devices at predetermined angular limits.

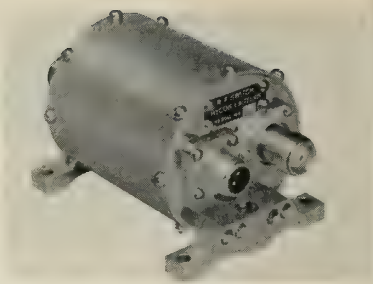


Two stainless steel cams may be rotated relative to each other to permit adjustment between rise from 0° to 180°. A balanced clamp secures the assembly to the shaft as well as locking the cams for the desired setting. Maximum diameter is 1 1/8" and hubs are available for 1/8", 3/16", and ¼" shafts.

Circle No. 237 on Subscriber Service Card.

HIGH-POWER RF SWITCH FOR SEVERE ENVIRONMENT

Hycon Eastern, Inc. has introduced a high-power RF switch, type 1696, that will withstand the severe environment encountered in advanced missiles. The new component will switch a transmitter from one antenna to another at high-power levels without mismatching the transmitter. In other words, this unit may be safely switched under power.



Environmental specifications are: shock to 100g; vibration 20g at frequencies up to 2000 cycles; temperature -40°F to +250°F; altitude unlimited because unit is pressurized.

Other specifications include: frequency range: 215 to 250 mc/s (other ranges on special order); attenuation: 0.25 db, maximum; power rating: 100 watts RF CW; VSWR: 1.2 maximum; switching: .15 sec. average; size: approximately 2½" diameter by 4½" long; weight: 2 lbs.; actuating power: 6 watts dc; crosstalk: 27 db down into unused channel; sequence: make-before-break.

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Professional Staff Appointments
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APPLIED PHYSICS LABORATORY
8643 Georgia Avenue
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West Coast Industry

by Fred S. Hunter

The night shift is back in business at Rocketdyne's test facility in the Santa Susanna Mountains, and once again test firing have been booming out over the rooftops of the San Fernando Valley long after the sun has gone down. These midnight firings reflect an accelerated program on *Atlas* engines. The *Atlas* people are unusually busy these days since they have to complete their test firing program this year to provide the production articles due in 1959. The *Atlas* now also has an added responsibility: minus warhead, it's to be the initial boost stage of the four stages of the WS-117L, the earth satellite reconnaissance vehicle being developed for the Air Force.

•

Temco's air-to-surface *Corvus* will equip the new low-level attack aircraft which Grumman is to build for the Navy, as well as the Martin P6M. Meanwhile, the Martin *Bullpup,* now being evaluated at Point Mugu and reported progressing satisfactorily, is to be used on attack-fighter aircraft such as the Douglas A4D. It may even be used on any propeller-driven ADs that may still be operational when the missile—radar guided—goes into service. Later on will come a more advanced air-to-surface weapon called the *Raven,* around which the Navy plans to design and build an entirely new aircraft. A contractor for the *Raven* may be selected shortly. Another new missile, a more sophisticated air-to-air bird called the *Eagle,* is reported also on the Navy schedule.

•

The Navy regards its 19,000-acre portion of Camp Cooke, the West Coast ballistic missile facility, as being ideal for this scale of operations because of sea-facing deep canyons. Moreover, Cooke is said to be the only place in the United States where a satellite could be launched sea-wise in a N-S direction due to coastline curvature. This orbit is needed so the satellite can "see" different portions of the earth. The Pacific test range, to be established for operation by Point Mugu and Cooke, will make an excellent complement to Cape Canaveral. The vastness and emptiness of the Pacific will provide more flexibility in firing missiles.

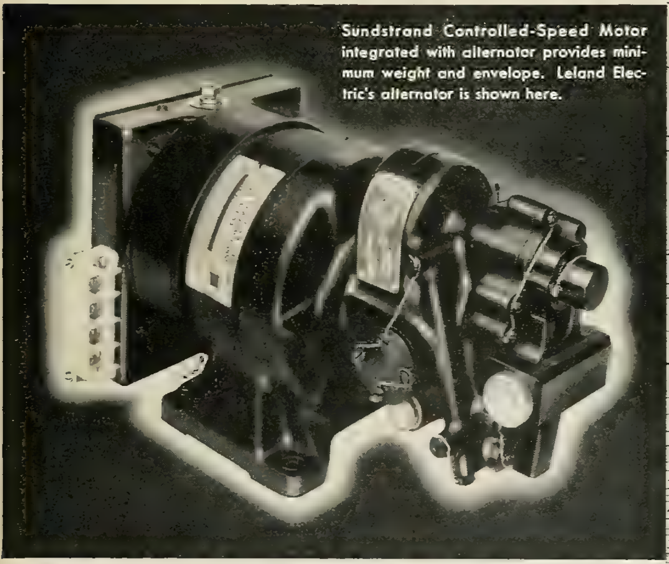
•

Marquardt Aircraft's new "Astro" division's activities can be expected to step up now that the new model test facility in the Newhall-Saugus area north of Los Angeles is complete. There's also some talk of a facility at Yucca Flat in Nevada. Marquardt has two nuclear projects in the shop now, one being a prime contract in the Air Force nuclear propulsion program. The other is a contract from General Electric for the development of a turbojet-engine control system designed for use with GE's nuclear power turbojet.

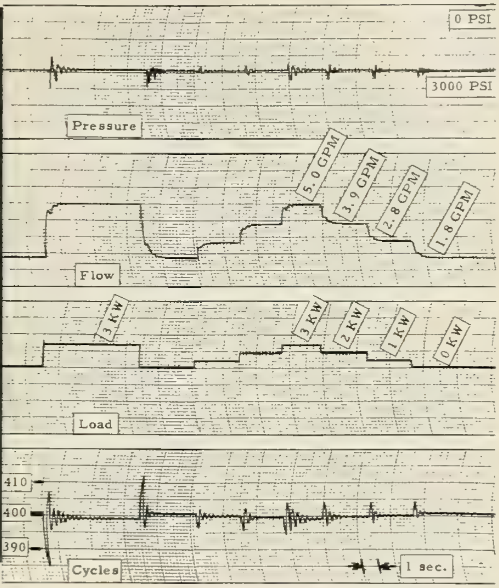
•

B. F. Coggan, general manager of the San Diego division, discloses that Convair is exploring the fantastic new field of antimatter. Physicists recently have shown that elementary particles, such as protons and antiprotons, release large amounts of energy on contact. It's possible that antimatter energy may be even more fundamental and powerful than nuclear fusion. Coggan suggests more knowledge about antimatter may supply the master key which will unlock many of the universe's innermost secrets—magnetic fields, aurora borealis, gravity. From this may come antigravity devices. And beyond this Coggan believes antimatter energy will be used in the future for propulsion to explore the universe.

New Electrical Power System for Missiles and Aircraft



Sundstrand Controlled-Speed Motor integrated with alternator provides minimum weight and envelope. Leland Electric's alternator is shown here.



Oscillograph trace of power-generating system performance with basic flyball governor. Governor trimming methods provide more precise control.

Operates off general hydraulic system, provides 4 kva rated power, capable of 100% overloads

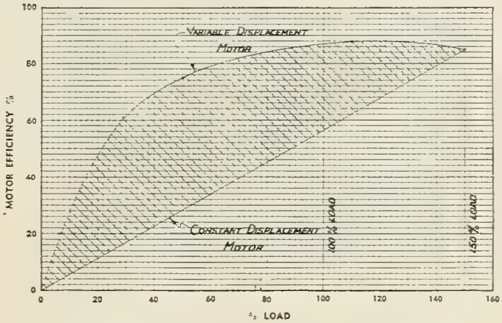
Use of a Sundstrand controlled-speed, variable-displacement hydraulic motor to drive a 400-cycle alternator provides an emergency and isolated electrical power-generation system with many desirable characteristics.

High efficiency throughout the operating range is assured because speed of the motor is controlled by varying the displacement to match the required torque output. The motor takes only that flow of oil from the general hydraulic system required to maintain the driven load. This eliminates the inefficient throttling necessary in a fixed-displacement motor system. There are no discontinuities in speed control from no load to full load.

The system is capable of handling 100% overloads for extended periods.

Integration of the motor in a common housing with the alternator provides minimum weight and envelope . . . maximum resistance to shock and vibration . . . and increased reliability. The integrated package also permits cooling the alternator with oil when air cooling is impractical.

The motor shown has a self-contained flyball governor. Models with external speed controls are available where variable speed is required. The motor itself is particularly suited to driving any load where torque requirements are variable and heating of hydraulic fluid is critical.



Efficiency advantage of variable-displacement motor over fixed displacement motor is shown for loads ranging from 0 to 150% of rating.

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- Higher temperature models available
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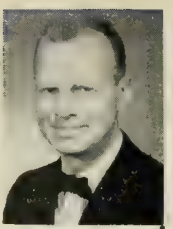

by Frederick C. Durant III

Optical tracking of earth satellites requires enthusiasm, technical appreciation, self-discipline and teamwork, in addition to simple but good optical and timing equipment. The Smithsonian Astrophysical Observatory (SAO) at Cambridge, Mass. has done an excellent job in staffing and outfitting the official U.S. Moonwatch tracking stations in many countries. Certification of competency of these teams in each country is made by a satellite coordinator appointed by the national IGY Committee. It takes dedicated effort to assure the complete manning, upon call, of the spotting 'scopes at dawn and dusk. Each team is comprised of 20 to 100 persons to compensate for fatigue, illness and those who may suddenly drop out for personal reasons.

A total of 205 Moonwatch teams in 11 countries were accredited and officially registered by last December. Of these, 114 are in the United States and 71 in Japan, 4 each in Argentina, Australia and the Union of South Africa, 3 in Chile, and 1 each in the Belgian Congo, Mexico, the Netherlands Antilles, Peru and Uruguay. The high interest in Japan was reported in m/r earlier (July 1957).

To date, the Japanese have responded to this scientific call in far greater numbers than any other foreign nation. The SAO recently issued a report of activities during the eight weeks after the launching of *Sputnik* I. During these first two months of the satellite era the Moonwatch teams of only four out of the 11 countries contributed to the 391 observations reported. The United States turned in 244 data reports of sightings, Japan, 128, Australia, 13 and Chile, one. The foreign sightings are particularly important because of their location in the Eastern and Southern Hemispheres. The Japanese made one-third of all the reports. Australia had the highest number of reports per team per country.

The Netherlands Antilles team has reported sightings since December. The major reason for holdup of Moonwatch operations in other countries has been delay in obtaining equipment. Ideally, an industrial sponsor is obtained to cover the cost of about $2000 to obtain basic equipment. There are no salaries.

The largest object, the final stage of the launching vehicle, was designated 1957 α_1; the satellite proper, α_2. These appellations follow astronomical practice. A third object, in all probability the protective nose cone, is designated α_3. Incidentally, it was a Japanese team that first sighted all three elements of *Sputnik* I, although other teams subsequently reported similar sightings while α_1, α_2 and α_3 were still near each other. The U.S. *Explorer* satellite launched by the Army *Jupiter*-C became the first 1958 satellite, and thus, 1958 α_1, etc.

•

Quite a spate of Russian books on space flight are available in the United States. Both paperbacks and hard covers may be purchased at the Telberg Book Co. and Four Continent Book Store in New York City. Although most works are in the original language, there is an excellent book by K. E. Tsiolkowskii translated into English.

•

26 February to 1 March an astronautical meeting was held at the Loccum Evangelican Academy, at Loccum-Hanover, Germany. This is believed to be the first such extensive space flight discussion at a religious institution. Such well-known astronautical personalities as Dr. Eugen Saenger, Dipl. Ing. Heinz Gartmann, Andrew G. Haley and Dr. H. von Diringshofen were on the program.

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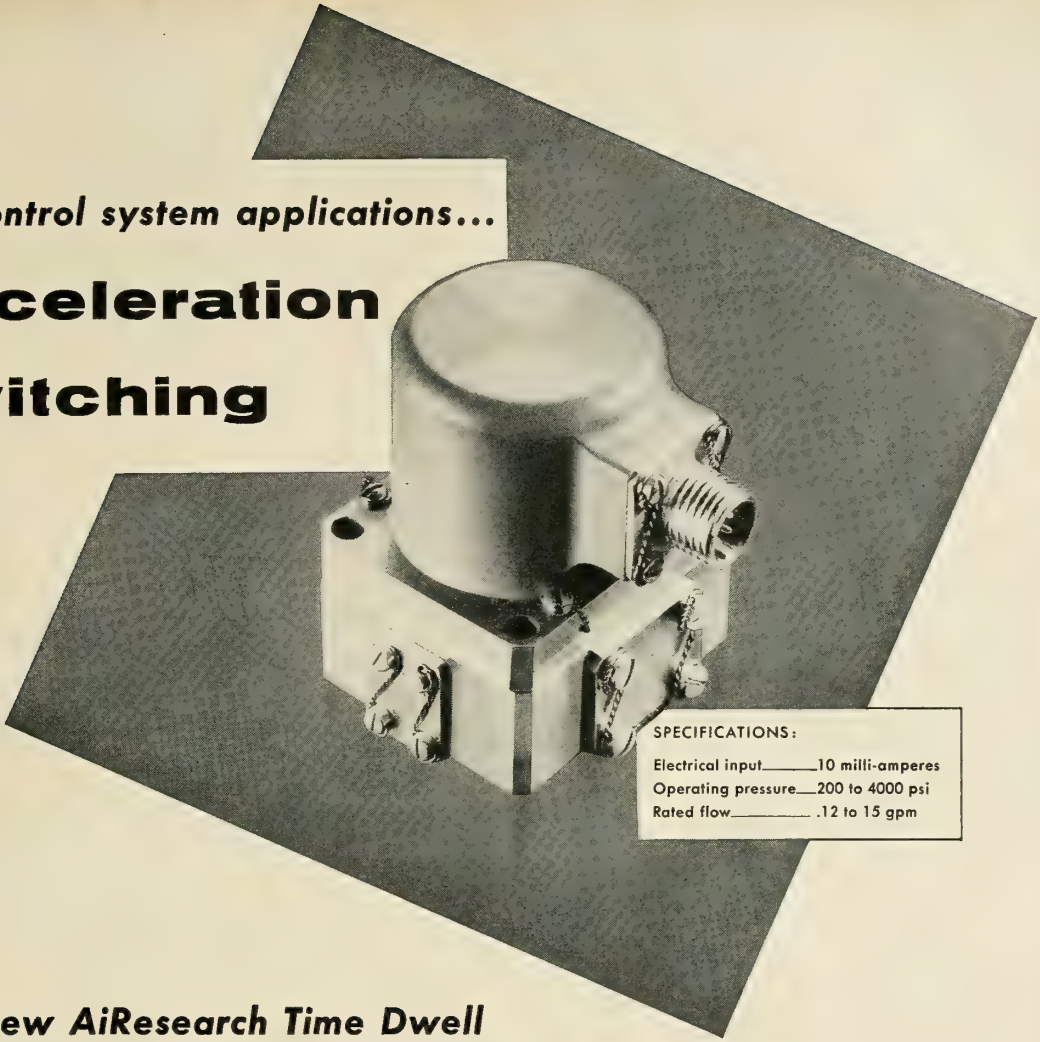

SPECIFICATIONS:

Electrical input______10 milli-amperes
Operating pressure___200 to 4000 psi
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Space Medicine

by Hubertus Strughold, M.D., Ph.D.

In addition to Col. Paul Campbell's Space Medicine Panel, as reported in my last column, there will be a panel on Simulated Atmospheres and Foreign Environments in Space Operations at the annual meeting of the Aeromedical Association, March 24-26, at the Hotel Statler, Washington, D.C. This panel will describe experiences in sealed gondolas with simulated atmospheres in recent ultrahigh balloon flights, in space cabin simulators, pressure suits and submarines. Other topics will be terrestrial microorganisms in a simulated Mars atmosphere and the medical significance of ozone. The writer will be chairman of the panel.

•

The symposium on Physics and Medicine of the Atmosphere and Space, sponsored by the School of Aviation Medicine, will be conducted by the Southwest Research Institute of San Antonio. It will involve medical problems in aeronautics and astronautics, and will emphasize the Geophysical Year. There will be about 40 speakers on the program, eight of them from Europe. It is scheduled for November 11-14 at the Hilton Hotel, San Antonio.

•

At the Annual Meeting of the Institute of Aeronautical Sciences held in New York City recently, a film was shown depicting Capt. Julian E. Ward (Department of Space Medicine, School of Aviation Medicine) drinking water in the gravity-free state during a ballistic curve in a jet plane. The use of a plastic squeeze bottle revealed no difficulties. However, drinking from an open container produced a mess of water bubbles in the face and surrounding area.

•

Dr. William M. Sinton of the Smithsonian Astrophysical Observatory recently reported on a new test to determine whether there is vegetation on Mars. This test is based on the fact that all organic molecules show strong absorption bands near $3.4\ \mu$, the wave length of the carbon hydrogen resonance. Spectra of Mars taken during the 1956 opposition indicate the probable presence of this band. Although the lichen spectrum was used for comparison, the similarity between them, of course, does not imply that lichens are present on Mars; it indicates only that organic molecules are present. According to Dr. Sinton, it seems unlikely, however, that "organic material would remain on the Martian surface without being covered by dust from storms, or being decomposed by the action of solar ultraviolet, unless they possess some regenerative power." These studies, therefore, support the Martian vegetation hypothesis. A strong regenerative power was first postulated by Dr. E. G. Oepic in the IRISH ASTRONOMICAL JOURNAL in 1950.

An outspoken promoter of the Martian vegetation theory is G. Tikhof of Russia's Alma-Ata Observatory, and a member of the Academy of Sciences in Moscow. Tikhof bases his opinion primarily on his findings regarding the ability of plants to survive in severe climates, such as in the subarctic, on the Pamir plateau, and to reflect and absorb infrared light in the blue-green areas on Mars. However, his scientific colleague, Olga W. Troizkaja, also a member of the Russian Academy of Sciences, in a paper published in 1952, expressed the opinion that only anaerobic, very cold-resistant microorganisms are conceivable in the severe Martian climate.

Another Russian astronomer, the well-known Professor W. G. Fessenkow, flatly rejects the whole theory of life on Mars in toto. There is apparently no party line in opinion so far as extraterrestrial cosmic matters are concerned.

Aircraft Nuclear Propulsion at Marquardt

by
Roy E. Marquardt
President

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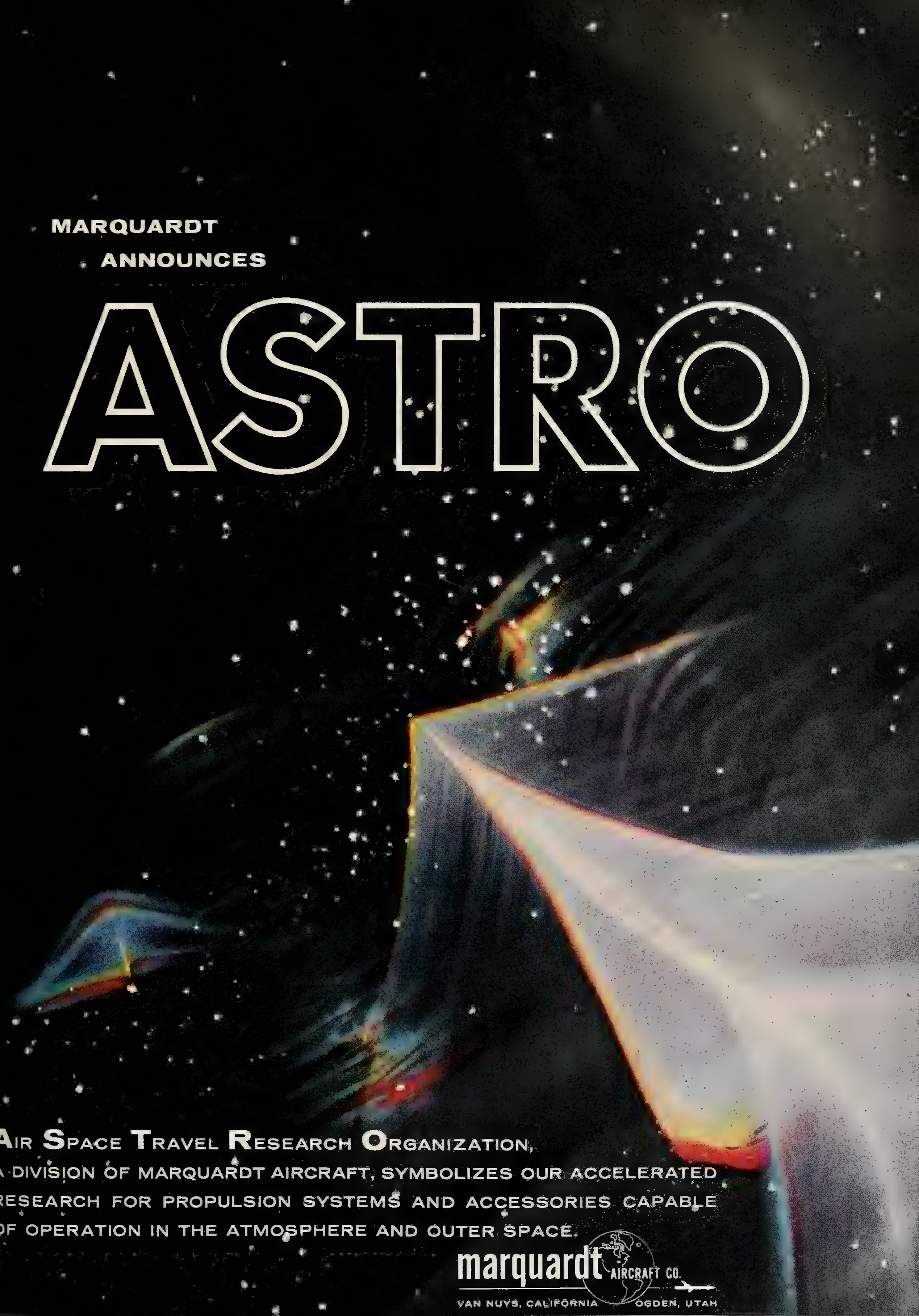

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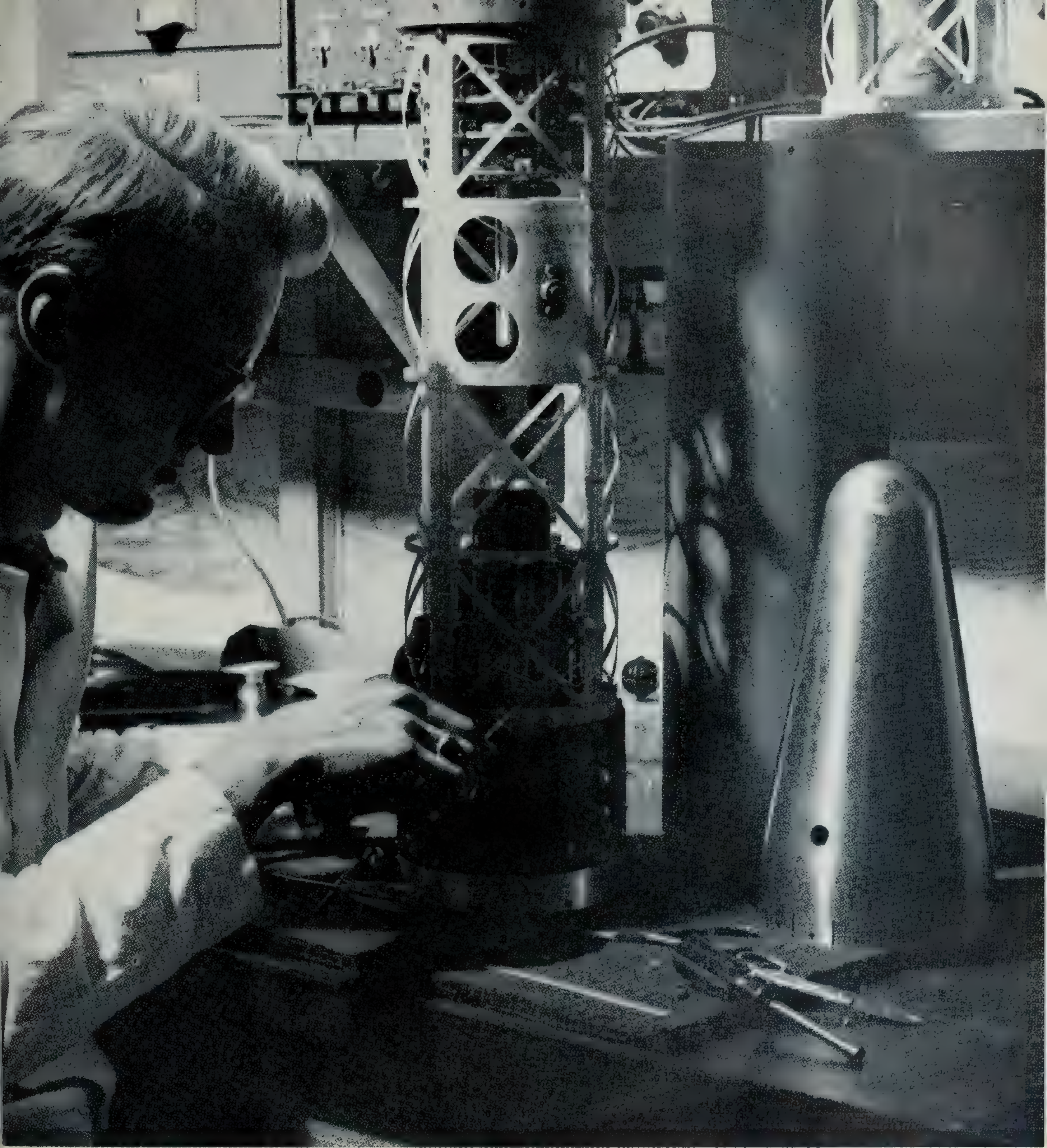

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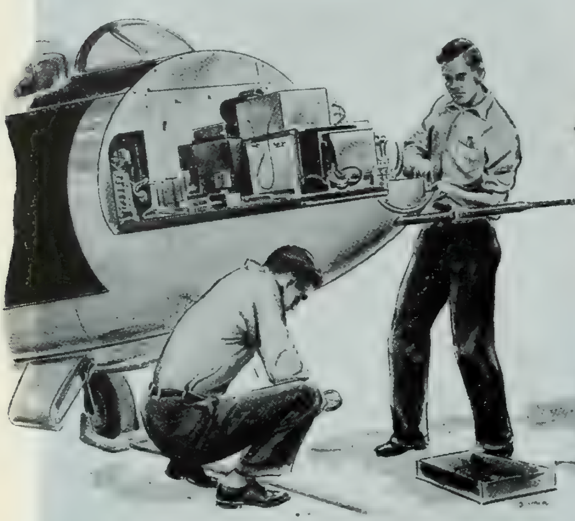

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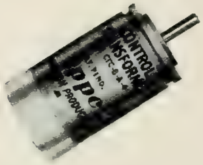
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						Input	Output		
Transmitter -Control Transformer	26	111	74	22.5	393	58 + j226	626 + j233	19	High Impedance load on CT
Transmitter -Control Transformer	26	111	75	21.6	377	58 + j226		19	50° load on CT
Transmitter -Control Transformer	26	110	.83	19.2	[illegible]	64 + j221		17	5° load on CT
Transmitter -Differential -CT	26	134	1.78	19.5	340		748 + j364	40	Output to High Impedance
Electrical Resolver -Electrical Resolver	11.8	115		7	120			52	Input to stator
Electrical Resolver -Electrical Resolver	26			15	260			53	Input to rotor

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missile electronics vol. 1, no. 5

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missile electronics news

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special features

Space conditions in the laboratory. Metal sputtering by ion bombardment duplicates high-velocity bombardment of satellites in space by atmos and molecules.

Dr. G. K. Wehner of the General Mills Electron Physics Laboratory describes some of the methods used to lengthen the mean free path of atoms used in sputtering experiments (p. 195).

The new look in ballistic-missile stabilized platforms. A description of the internally gimbaled platform.

Army Ballistic Missile Agency philosophy stemming from early work in Peenemunde is described by the Deputy Director of the Guidance and Control Laboratory, ABMA, F. K. Mueller (p. 199).

Environmental limits of solder connections. Some considerations on a subject largely taken for granted.

Alvin B. Kaufman, chief development engineer of the Arnoux Corp. provides for the solder user, background material underlying the fundamentals of reliable military usage (p. 201).

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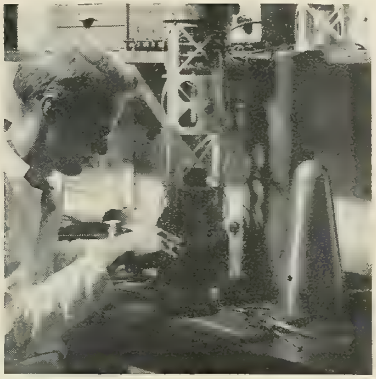
cover picture:



Clifford J. Finnie of the Jet Propulsion Laboratory, Cal Tech, assembles interior instruments used in the Explorer *into the fibreglass lattice sleeve which forms part of the satellite. The two transmitters used to telemeter information are on either end of the mounting sleeve. One transmitter was of relatively high power and lasted only 12 days, but the low-power unit has an estimated life of two to three months. The now defunct transmitter, operating on 108.03 mc, sent data on the skin temperature of the rear area of the satellite, internal temperature, micrometeorite impact and cosmic-ray counts. The low-power unit, operating on 108 mc, telemeters information on the skin temperature of the satellite forward area, the nose-cone temperature, micrometeorite impact and cosmic-ray counts. The transmitters were designed as independent units from batteries to antennae so that malfunction of one would not affect the other.*

photo credits: *ABMA, pp. 199, 200; Arnoux, pp. 201, 203, 206; Jet Propulsion Lab., Cover; Raytheon, p. 185; Sperry Gyro, p. 188.*

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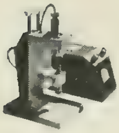
rotor bearing preload micrometer

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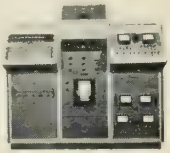
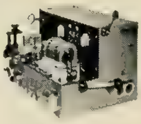

ICBM simulator

rotor micrometer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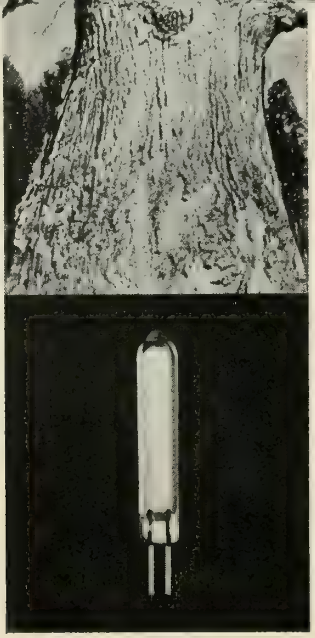

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missile electronics news

Details of *Jupiter*-C Guidance System Revealed

by Raymond M. Nolan

NEW YORK, N. Y.—At a recent meeting here, scientists from the Guidance and Control Laboratory of the Army Ballistic Missile Agency discussed the guidance aspects of the *Jupiter*-C satellite launching vehicle.

Dr. Walter Heussermann, chief of the Guidance and Control Laboratory, demonstrated the orbit of the satellite with a world map and a transparent overlay. As he was speaking, he showed the exact position of the *Explorer*.

Questions brought out the fact that the *Jupiter*-C was stabilized in roll and yaw by an LEV-3 gyro system (see m/r February, "Workhorse of Inertial Guidance"). This probably means that the guidance system which put our satellite into orbit comprised an LEV-3 for roll and yaw, a Ford Instrument air-bearing gyro for the critical pitch control, and air-bearing gyro accelerometers for velocity and distance determination.

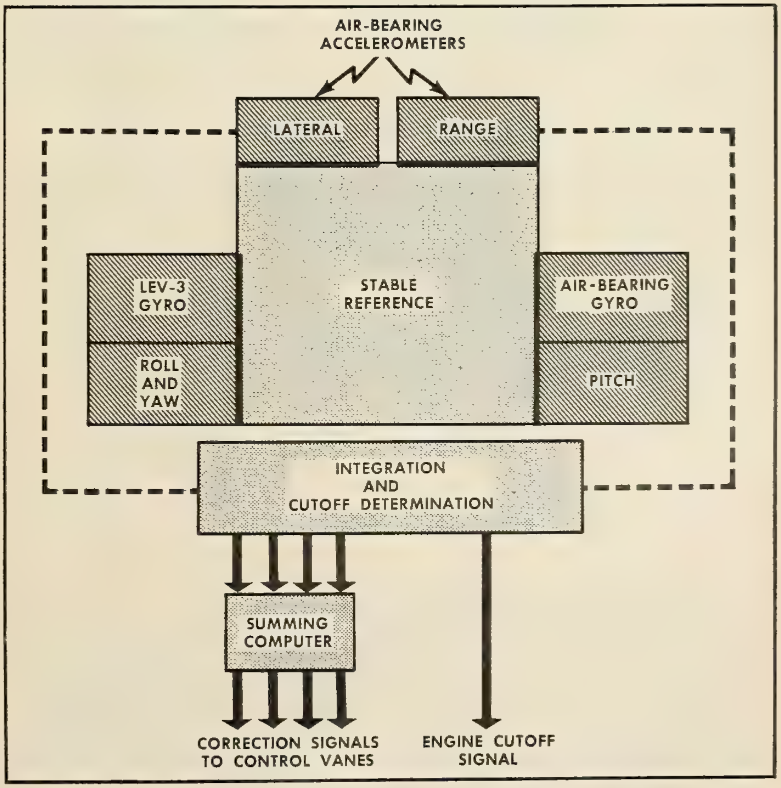
The use by ABMA of an LEV-3 in the system points to a decided difference in the *Jupiter*-C and the *Vanguard* programs. The LEV-3, a comparatively cheap device manufactured by the Waste King Corp., was developed by the same team that put up the *Explorer*—Dr. Wernher von Braun and associates—in World War II for the German V-2 missile. Development of the air-bearing gyros and accelerometers began even before that with early development work in the mid-1930's at Darmstadt Technical Institute.

In contrast, development of the guidance for the *Vanguard* presumably began in 1955 when the decision to drop Project *Orbiter* and proceed with *Vanguard* was made.

The guidance system of the *Jupiter*-C was in existence as a package for quite some time and required only installation and simple check-out when the word finally arrived that *Jupiter*-C could be launched.

Dr. Heussermann pointed out that, in spite of repeated criticism that the air-bearing instruments are delicate and difficult to produce, they are in fact extremely rugged devices and produce no more manufacturing difficulties than any reasonably complex instrument. No such criticism was voiced about the LEV-3 since it is obviously an easily produced, low-cost item.

An interesting statement made by Dr. Heussermann was that the guidance system on the *Sputnik* vehicles was probably more sophisticated than that on the *Jupiter*-C. He surmises this



Probable guidance and control system for the JUPITER-C first stage.

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NO COULOMB FRICTION IS EXHIBITED in this design, bearings are eliminated by suspending the mass between two disc springs. Acceleration inputs move the magnetically damped mass, causing a proportionate change in the output voltage of a differential transformer. Cross-talk effect is minimum (0.003 g/g at 10 g cross acceleration on a 1g instrument); repeatability and hysteresis are below thresholds of measuring equipment.

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since we have to spin our final three stages for stabilization while the Russians presumably have some self-contained stabilization device for their final stages.

The *Jupiter*-C upper stages are spun because all stabilization is lost when the upper part of the vehicle is pitched into a position horizontal with the earth. This would tumble any sort of gyroscopic stable reference and require that further stabilization come from some other source.

Mr. Fritz Mueller, also of the Guidance and Control Laboratory, stated in answer to another question that the gyros were smaller than those ordinarily used in a *Redstone* missile (the first stage of the *Jupiter*-C). This could mean that they are of the same type used on the *Jupiter* missile since it was announced previously that the *Jupiter* guidance and control system was essentially a miniaturized version of that used on the *Redstone*. If so, this might mean that the *Jupiter* guidance problem has been licked.

Based on remarks by Dr. Heussermann and Mr. Mueller, the accompanying sketch shows the probable makeup of the guidance and control system in the *Redstone* missile, which formed the first stage of the *Explorer* launching vehicle. The system is pure inertial but might have had a radio link to accomplish the final tilt to place the last three stages in a horizontal position.

In operation, the LEV-3 and air-bearing gyros stabilize a platform on which the two accelerometers—for measuring range and lateral translation—are mounted. The accelerometers deliver signals to computers for further integration and summing. Final outputs of the system are the cutoff signal to the main engine and vane control signals.

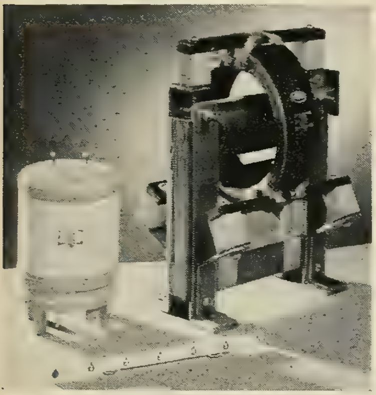
The only departure from the inertial systems used on the *Redstone* and *Jupiter* missiles (which use air-bearing gyros and accelerometers) is the inclusion of the LEV-3 as a stabilizing element. Since the LEV-3 has been available for such a long time, it is probable that the guidance system for the defunct Project *Orbiter* was identical or at least similar to the one used on the *Jupiter*-C.

New Cooling Techniques Lead to Miniaturization

Startling reductions in the size and weight of transformers through the use of new cooling and insulating techniques have been announced by the Raytheon Manufacturing Co.

The new techniques fall into two broad categories. In the first, heat resulting from unavoidable losses in cores and coils is carried away by the use of a volatile, heat-stable, fluorochemical liquid which boils on contact with heated areas. The vapor formed by boiling condenses when it contacts the cooler surface of the container, completing the cooling cycle. Heat transfer coefficients up to 20 times those attainable with conventional transformer oils are readily achieved.

The second technique makes use of stable fluorochemical vapors up to 50 times the weight of air. These vapors are characterized by excellent heat-transfer characteristics (equal to or better than oil), high dielectric breakdown strength (equal to oil at one atmosphere, better than oil at high pressure), and unequaled corona-suppressing properties.



Comparison of size between miniaturized transformer using air as a dielectric and new unit using heavy fluorochemical vapor.

Cooling effects better than those obtainable in oil are obtained by each of these two techniques.

Weight reduction in some cases has been as great as 75 per cent, an impressive figure in view of the amount of weight that transformers contribute to missile electronic equipment.

Norden-Ketay and Solar Aircraft Merge

The combination of Norden-Ketay Corp. of Stamford, Conn., a designer and builder of complex electronic systems and instruments, and Solar Aircraft Co. has been approved by the boards of directors of both companies. The transaction will be submitted to the shareholders at an early date, Paul Adams, chairman of the board of Norden-Ketay, announced.

The basis of the transaction would be the issuance of approximately 230,000 shares of Solar common stock, subject to contingencies. Norden-Ketay has approximately 1,300,000 common shares outstanding and is listed on the

Individual Initiative and Coordinated Teamwork

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American Stock Exchange. There are currently 700,052 Solar common shares outstanding, listed on the New York Stock Exchange.

Mr. Adams also released 11 months' figures for Norden-Ketay showing sales of $25,213,724 and a loss of $1,107,667 after interest expense and other deductions. The year-end audit is proceeding and further loss adjustments are indicated.

In a letter to Norden-Ketay stockholders, Mr. Adams stated: "Your company was hard hit by Government contract rescheduling and the receipt of virtually no new production business while the defense effort was being appraised. Serious reduction of working capital occasioned by the losses made it imperative that we seek substantial additional capital funds in order to preserve our status and maintain the potential of our company."

Solar's sales in the fiscal year ended April 30, 1957 were $83,118,500 and indicated sales of Norden-Ketay in the year 1957 were approximately $27,000,000. Solar is a major designer and manufacturer of products made from stainless steel and other hard-to-work metals. Products include aircraft and missile engine assemblies, airframe assemblies, small gas turbine engines, industrial expansion joints, and a variety of other military and commercial items. Norden-Ketay's output is largely used in aircraft and missiles, radar and fire control systems, and automation equipment.

Solar has plants in San Diego, Calif. and Des Moines, Ia. Norden-Ketay has plants and laboratories in several eastern cities and in California. The combined employment of the two companies approximates 6300.

NPN Computer Transistors Now Being Mass-produced

A new advance in production techniques resulting in the availability of substantial numbers of high-speed switching computer transistors was recently announced by Allan Easton, vice president of the marketing division of General Transistor Corp.

Mr. Easton said, "While we have been producing high-speed switching computer-types for a long time, no large-volume production was scheduled until we were making highest quality transistors with good yields." He went on to state that the increased availability is especially important because NPN computer transistors will now be available in large quantities.

In conclusion, Mr. Easton stated that he expected advanced development effort would bring similar results on newer transistor types.

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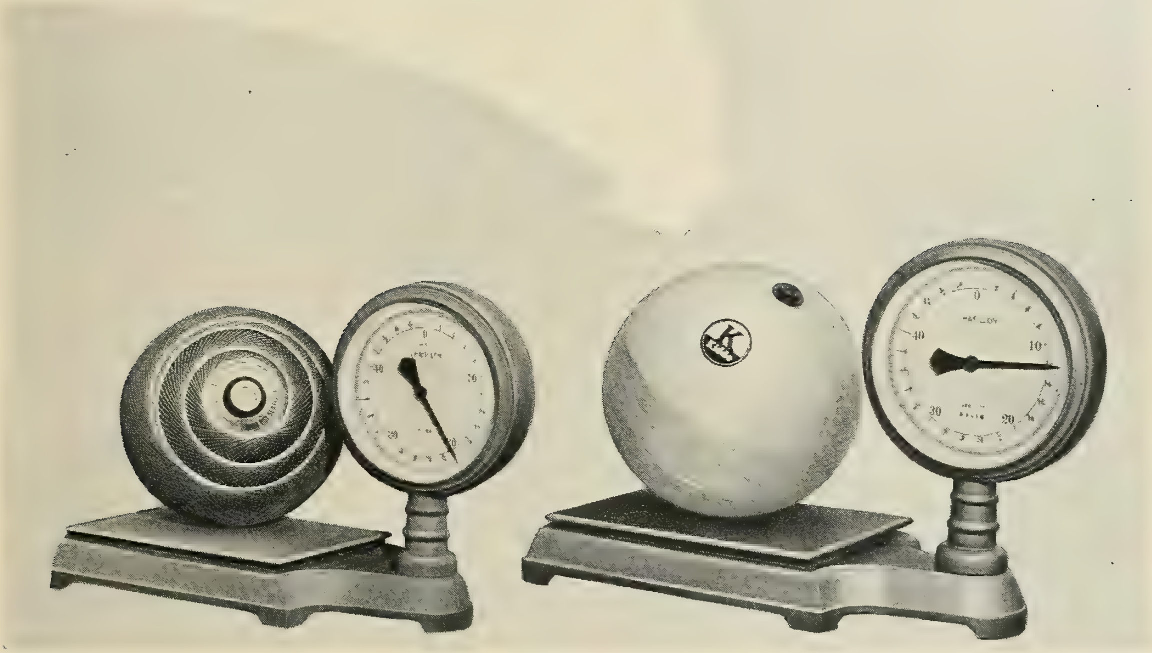

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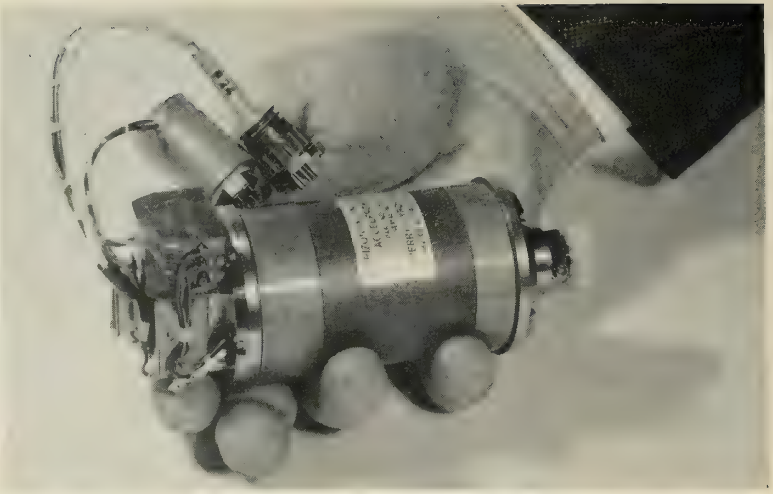
Sperry Shows Improved Type of Gyro Suspension



Sperry Gyroscope recently revealed details of a radically new form of suspension for integrating gyros. Rather than a pendulous weight (as in many precision accelerometers by offsetting the gyro rotor), the Sperry unit suspends the sensing element in a silicone fluid and then spins sensor and fluid while the accelerometer is operating.

Three small metal cylinders, self-contained, form the device. Smallest internal cylinder is the floating sensor or acceleration-sensitive element. This is immersed in a silicone fluid inside the next larger cylinder, which in turn is supported by bearings within the outer shell or case.

Inside the silicone fluid, the sensor would normally rise to the top of the liquid, except that the middle cylinder is spun at 1000 rpm by a small external motor. This rotates the silicone fluid as well, and produces hydrostatic forces that exactly center the inner sensor away from adjoining walls without any bearings at all.

Because the sensor is supported only by a spinning liquid, no static friction remains and the slightest component of acceleration along its longitudinal axis moves the sensor along this axis for precise electronic measurement.

As fluid is displaced from one end to the other by a piston-like action of the sensor, it exerts a viscous restraint on motions of the sensor. The use of special bypass tubes eliminates the possibility of variations in this restraint as the float moves. This combination cushions fore-and-aft movement in a manner that produces internal velocity which is exactly proportional to external accelerations.

Weight of the unit is one and one-half pounds; the size is illustrated by the accompanying photograph. Accuracy was conservatively quoted by W. G. Wing, head of components engineering at Sperry as "within hundredths of one per cent." He stated that threshold sensitivity was better than 10^{-5} g's or 100,000th the force of gravity. An example of this is the ability of the new

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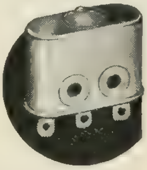
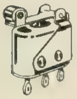

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Release Force, min.	3 oz. or 6 oz.	6 oz.
Differential Travel, max.	.0005—.005	.012
Overtravel, min.	.007	.007
Electrical Ratings, 30 Volts D.C.	3 amps, Inductive 5 amps, Resistive	10 amps, Inductive 10 amps, Resistive
Life at Rated Load (actuations)	100,000	10,000 (Inductive) 25,000 (Resistive)

Haydon 6100 Series Switches are available with a wide range of characteristics and can be used with a variety of Haydon standard actuators, such as those shown at the left. Haydon also provides a complete design and development service to solve your problems in hermetically sealed switches and suitable actuators. For further information, write for data on the Haydon No. 61191 Switch.

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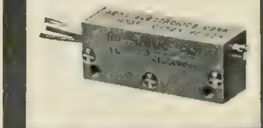
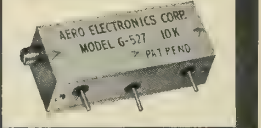


Model G-627



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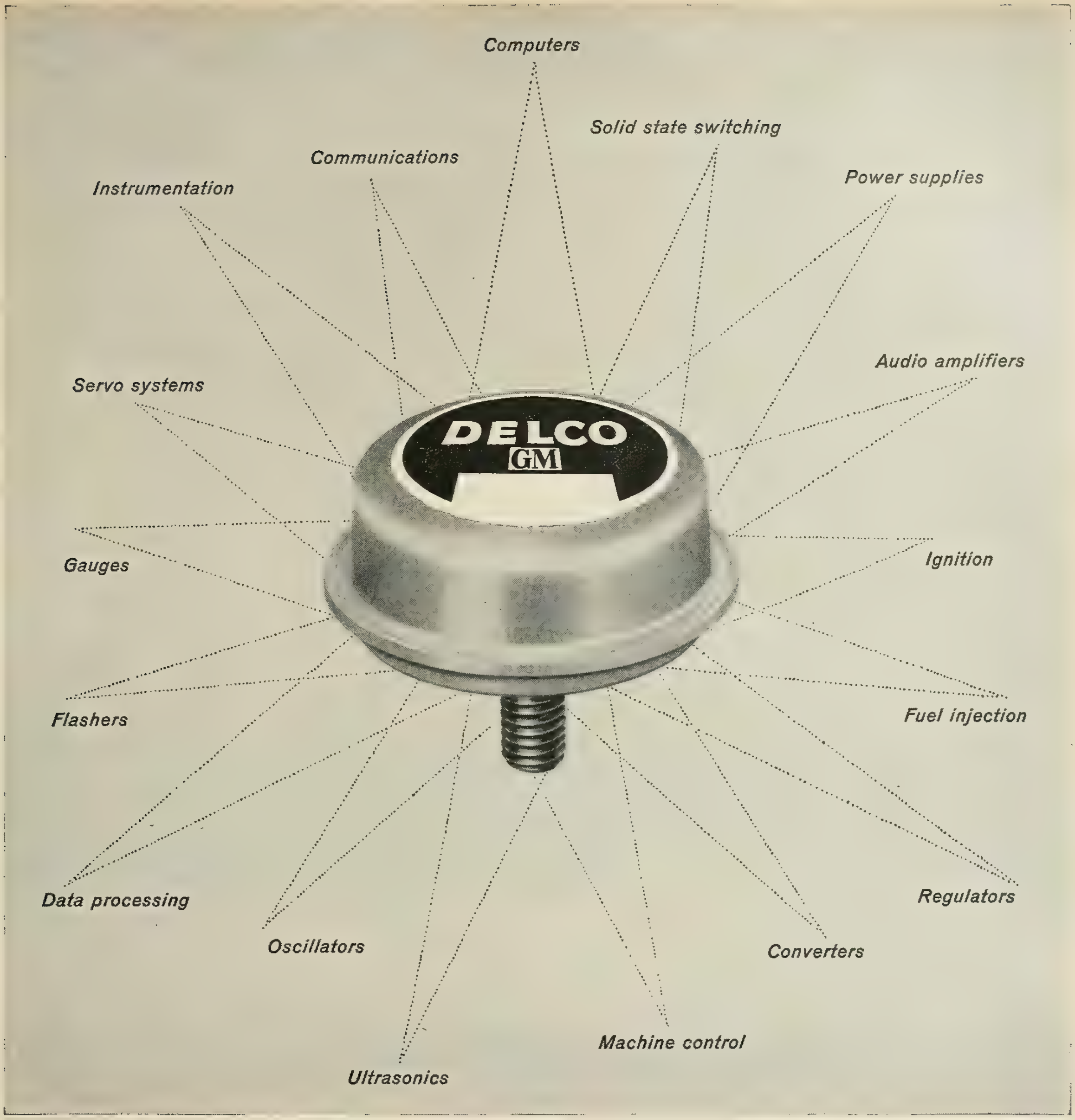
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accelerometer to detect the gravity force produced by tilting its sensitive axis as little as 2 seconds of arc—approximately the angle you get by raising a one-and-one-half-mile-long rigid pipe only one inch at the farther end.

Mr. Wing sees immediate application for long underwater voyages such as those preparatory to firing a *Polaris* missile. This might mean that the accelerometer would be used in a version of the Sperry SINS (Shipboard Inertial Navigation System) now in use on the USS *Compass Island*. The SINS was originally developed for the fleet ballistic missile version of the *Jupiter* missile and is presumably being used for the *Polaris*.

Simplified Data-handling for Wind Tunnel

A new data-handling system, capable of handling information from a total of 300 strain gauges and 100 thermocouples with an accuracy of better than 0.25 per cent of full scale, has been put in operation for wind-tunnel testing by the systems division of Beckman Instruments.

In high-speed automatic scan, the system samples 400 transducers at a basic rate of 400 per second. It is possible to vary the sampling period from one complete scan per second to one per 100 seconds.

In single-scan operation, the system makes a complete scan only in response to the operator pressing a button. Another feature is the capability of selecting any one of the 400 transducers and obtaining a graphic plot of the individual channel.

Input circuitry of the system has several unusual features. Transducer inputs are multiplexed into 10 per amplifier so that 40 amplifiers are used rather than 400, reducing the maintenance problem. Synchronized electronic and mechanical switching is used, including oil-immersed stepping switches capable of more than 300 million operations before failure. Solderless wiring and gold-plated contacts are used to eliminate noise and thermal effects from the low-level signal paths.

Extensive modular construction is used to aid in servicing and minimize down time. Input amplifiers are all plug-in units and the high-speed electronic commutator is easily removed for service.

The system uses an analog-to-digital converter to change transducer outputs into computer inputs. The converter compares the analog trace to a linearly changing voltage which calibrates itself against internal reference voltages 1000 times per second, the digitalization time.

The digital information is stored on magnetic tape and transferred to punched cards by means of a transistorized tape-to-card converter. Besides test data, all identifying information such as the date, time of sampling and the channel group number is recorded. Also, an analog signal is available for use with an X-Y plotter.

Neatest feature of the system is a servo control "gun" for rapid balancing of the strain-gauge transducers. The operator places the end of the "gun" over each balance control knob and the device automatically rotates each knob in search of a null position which balances the strain-gauge network. The trigger of the "gun" automatically switches the balancing circuit to the next network.

A system such as this points to the trend to a larger number of data channels, say engineers of the systems division, and additional multiplexing of amplifiers may be the answer. Future demands for systems capable of operating at the rate of 10,000 to 20,000 channels would require rack arrangements of tremendous size, but further advances in the art of solid-state amplifiers will probably be responsible for a total size within reason.

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Large new electric furnaces—the only ones of their type—were designed by Solar to braze the sandwich structures. In addition to stainless steel, various high alloys are used for the honeycomb cores, and research in the use of other metals is in progress. For more than a decade Solar has placed special emphasis on guided missile technology—developing new metalworking techniques for the missile age. Solar's versatile missile team is available *now!* For more information write to Missile Engineering, Dept. D-160, Solar Aircraft Company, San Diego 12, California. *Designers, developers and manufacturers of gas turbine engines, expansion joints and aircraft engine, airframe and missile components.*

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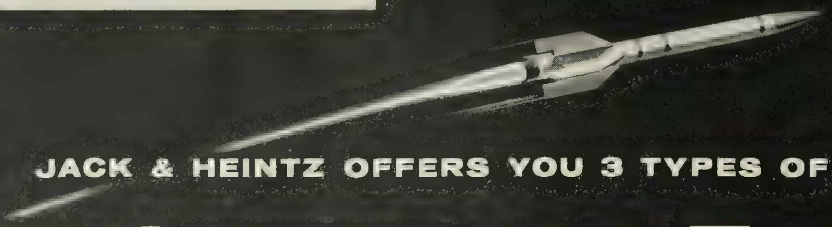

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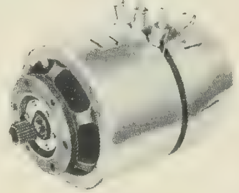
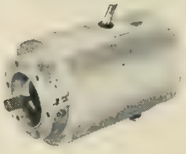
Representative J&H Generator Designs for Missiles	Vapor-Cooled 	Oil-Cooled 	Thermal Lag 
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Astrionics

by Henry P. Steier

Latest round of satellite-scurrying occurred just before the Army put up its *Explorer* satellite. Last minute additions to the Minitrack tracking stations were needed. A few days prior to the event, word went out to prepare for installation of special recording equipment to handle signals from the *Explorer*. This was needed for a different mode of signal from Army's "Microlock" position-fixing system developed by Jet Propulsion Laboratory some time ago for Army satellites.

•

Despite our success in getting a satellite up, a very important part of the program is still dragging its feet—installation of tracking cameras. From these was supposed to come the really precise observation of satellites, and accurate data on what they were doing. So far only two of 12 planned cameras are available. One is at White Sands Proving Ground, the other is en route to the Union of South Africa. Industry sources say mechanical problems are delaying production.

•

Optics job for the cameras has been called "one of the most difficult optical production jobs ever attempted." However, this work is on schedule. Optical design calls for a 31-inch Schmidt-type mirror and three aspheric corrector plates. Perkin-Elmer Corp., Norwalk, Conn., has contract for this work.

•

Real breakthrough which permitted start of radar detection system for ICBMs was development of high-powered transmitters, according to Lt. Gen. Donald A. Putt, Asst. Chief of the Air Staff for Development. A $721-million program involving Radio Corporation of America, General Electric Co. and Western Electric Co. was revealed by Putt in testimony before the House Appropriations Committee. Detection radar configuration is still cloaked in security. The other radar, for tracking after target acquisition, is similar to the Millstone Hill, Mass., radar prototype now being operated by Lincoln Laboratory of MIT.

•

Heart of the radio frequency power system employed in the tracking radars is said to be 11-foot klystron tubes which supply signals to the 84-foot-diameter parabolic reflector used. Tube is believed to be the X626 ceramic-metal tube built by Eitel-McCullough, Inc. It delivers 1¼ million watts peak power and 100 kilowatts average power. Frequency of the system is believed to be near the lower end of the spectrum usable for radar.

•

Detection radar must be a whopper from hints dropped by Putt in the testimony. Radar antennas must be located at some distance from the power-generating plant. It was implied that strong interference generated in the powerplant's vicinity would interfere with radar's operation.

•

Primary job of the ICBM detection system will be to make rapid computations of the missile's trajectory and find the predicted impact point. Computer will be of small size and transistorized. Sylvania Electric Corp. revealed it is a major subcontractor of RCA for the super radar, and will be responsible for the data-processing phase of the warning system. According to estimates, 15 minutes warning time is about what the system will give. That's not enough to evacuate many people, but ought to be enough to get an anti-missile missile on-course for interception.

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ROCKETS AND MISSILES

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WINTERIZATION

metal sputtering by ion bombardment

basic research
for tomorrow's metals

by G. K. Wehner

WHEN METEORS go hurtling through space and collide with a planet, they leave huge craters on the planet's surface. And when sandblasting is used to clean the grimy surfaces of metropolitan buildings, particles of the surface being cleaned are knocked loose along with the grime.

In each case, a solid surface is altered by the *impact* of the "particles" striking it.

Likewise, the basis of *sputtering*, as the term is used by physicists, is the alteration of a solid surface caused by the impact of striking particles. In the study described here, the bombarding particles are ions of mercury gas which are made to strike a metal surface. The impact causes surface atoms of the metal under study to be ejected. Under prolonged ion bombardment metals literally are disintegrated.

One of the objectives of working on sputtering in the laboratory is to set up and investigate conditions similar to those which exist in outer space. In this outer space an object like a satellite encounters collisions with free-wheeling atoms and molecules. Such collisions are capable of knocking loose atoms of even the best metals we now have. This is one of the reasons why the sputtering investigations are significant—in providing basic data in the search for materials that will withstand the atom and ion bombardment at high velocity flight in the ionosphere and in outer space.

These conditions generally can be duplicated by putting the target metal in a chamber which contains an ionized gas at reduced pressure. The ions, accelerated under the influence of an electric field, bombard the target surface and sputter the target metal.

To one unfamiliar with this work, the equipment used for these sputtering studies appears to be a complex arrangement of glass chambers and tubes.

The phenomenon of sputtering by ion bombardment has been known for a long time. It was first recognized on cathodes in gas discharge tubes and mentioned as cathode sputtering in an English publication as early as 1852. Current work was started at Wright-Patterson Air Force Base, Ohio.

Besides paving the way for the development of metals for high velocity flight, the purpose of the project is to understand the sputtering phenomenon thoroughly, providing necessary data for further work in such fields as gas discharge studies, crystallography, surface physics, metallography, etc. In other words, the work fits the category of basic research—creating basic scientific knowledge for use in a potentially great number of applications.

Until recently one of the major obstacles to detailed sputtering work was that the mean free path of the bombarding ions was too short. (The "mean free path" can be defined simply as the average distance that the ions travel without hitting anything.) That is, when the bombarding ions were released from their source and directed toward the target metal, many of them struck gas atoms and were reflected off in various different directions.

To make headway in learning about sputtering, it is necessary to know the exact bombarding energy that the ions impart when they strike the metal, and the angle at which they strike. This is impossible when many of the ions are bouncing from one gas atom to another in the chamber rather than traveling a direct route from the source to the metal.

To lengthen the mean free path of the ions, therefore, the obvious answer is to reduce the gas pressure (increase the vacuum) in the chamber so that there are fewer gas atoms to collide with the ions in their flight to the target metal.

Reducing the gas pressure also solves another problem. That is, at the *higher* gas pressure, many of the atoms that are sputtered from the surface of the target metal collide with gas atoms and are reflected back to the target metal. With this happening there is no way of knowing accurately the *rate* of sputtering, and the yield of sputtered atoms deposited on the chamber wall is greatly reduced. Indeed, it seriously interferes with learning how a certain metal withstands ion bombardment.

To eliminate such problems, the gas pressure is decreased to a level (10^{-3} mm of mercury or less) where by the sputtered atoms are allowed to travel freely from the metal to the collector, or the chamber walls. At this level, the *unobstructed* flight distance of the ions going toward the target metal is greater than the dimensions of the chamber. Sputtering then becomes independent of the tube geometry and gas pressure.

To provide the bombarding mercury ions with the essential high velocity, it is necessary to impose an external potential difference between the mercury ions and the metal target. In the present studies the target metal is given a negative potential to attract the positively charged bombarding mercury ions.

A difficulty which has had to be solved in this research is that oxide layers of some metals are more resistant to sputtering than others. Even when they are thoroughly removed before the metal is placed in the sputtering chamber, oxide and other such layers may be reformed continuously during the sputtering process. This occurs

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Dr. Wehner is associated with the General Mills Electron Physics Laboratory.

either through impurities diffusing from the bulk of the metal to the surface or because of impurities from the gas settling down on the metal surface. Even with the pressure of impurities in the tube at an extremely low level (10^{-6} mm mercury) a complete layer one atom thick would be formed on the surface of the metal in one second if every atom of the impurities stuck to the surface. Therefore, the ion bombardment would have to compete with the formation of such interfering surface layers.

Obviously, if oxide layers were allowed to build up on the metal, they would complicate the sputtering conditions. It would be impossible to get precise, clear-cut data on pure metals.

So, a basic requirement for reliable sputtering measurements is that the density of the bombarding ion current be high enough to overcome the formation of surface layers. Ion beams in a high vacuum are normally limited to a very low current density. Under such conditions each surface atom of the target metal receives only one impact every 100 seconds.

In the work at General Mills, a method employing a *vacuum arc discharge* has been developed which increases the current density by more than a thousand times—about 10 impacts per surface atom per second—even at a low gas pressure. At such high current densities weighable amounts of metal can be sputtered off in a reasonable time even when ions are striking at relatively low speeds. Thus it is possible to collect reliable sputtering data in the region of low velocities of the bombarding ions (30 to 400 electron volts), a region which has never been thoroughly investigated.

An analogy might serve to illustrate why this low velocity region is of much interest: If a slate wall is "bombarded" with bullets, it is chipped, pitted and otherwise marred in a rather haphazard fashion. But if the wall is eroded by the lower velocity of wind-driven sand, for example, the gentle erosion or etching pattern reveals structural details quite clearly.

A certain minimum velocity of the bombarding particles is necessary before sputtering will occur. In fact, charged atoms, or ions, are used rather than neutral atoms because ions can be more easily accelerated to the required velocities.

In an effort to simplify sputtering conditions in the current work, metal single crystals, rather than polycrystalline metals, are used as targets. (Metal single crystals are metals "grown" in such a way that the arrangement of the atoms is regular and identical throughout the whole piece. Polycrystalline metals consist of microscopically small crystallites which are randomly oriented.)

The use of metal single crystals as targets revealed the surprising discovery that when metal atoms are sputtered they are not ejected from the surface randomly but leave in certain directions determined by the *arrangement* of the atoms in the crystal. In other words, the atoms of the target leave the surface of the crystal in directions of closely packed rows, or lines formed by atoms lying directly against each other.

Heretofore it was widely held that sputtering resulted from heat caused by the impact of ions on the metal atoms. (Surface atoms of metals *can* be ejected by heat. This is called evaporation, or sublimation, and is not to be confused with sputtering.)

It has also been shown in the present work that sputtering will not occur unless the bombarding ions have a critical minimum kinetic energy—threshold energy—for any one metal.

In studying the threshold energy requirements for many different metals, a surprising result is that the velocity of sound in the metal comes into play. That is, the threshold energy for a given metal is related to the manner in which the metal transmits sound energy vibrations from one atom to another. Thus, it turned out that threshold measurements provide a simple method for measuring sound velocities in metals.

It can readily be seen that sound velocities are important in sputtering when one considers that surface atoms are ejected by a vibration from *within* the target metal. The momentum of the impact of an ion is directed to the interior of the target metal. This momentum is then *reversed* in a certain way by the bulk of the target metal, and travels most efficiently along a row of closely packed atoms to the surface where it ejects the surface atom at the end of the row.

Other interesting, applicable results of sputtering are the etch effects observed on target metals after ion bombardment.

As a tool in studying structures of metals, controlled sputtering has the advantage over chemical etching of being equally applicable to almost all metals. Also, it involves only two parameters—kinetic energy of the bombarding ions and target temperature.

The naturally occurring arrangement of the metal atoms into a perfect lattice becomes deranged because of slight impurities, and heating, molding and machining of metal processing. When these out-of-place atoms are jarred free by sputtering, some of them, along with other loosened atoms, find their way back into the natural lattice, or pattern, of the metal.

When the ion velocities used in

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the present work are converted from electron volts to miles per hour, it may be seen that the region of the lowest velocities studied here is of the order of the velocity necessary to hold an earth satellite in its orbit. Also, the density of the gas at altitudes above 100 miles is so low that the mean free path of the gas atoms is very large. These atoms and molecules actually bombard the satellite surface with the flight velocity of the satellite. For many metal and gas combinations this velocity is above threshold, especially at the sides of the satellite "target" where the incidence is oblique and the thresholds are low. Under such conditions the sputtering rate should increase with the fifth power of the velocity.

Hence, such sputtering effects should be much more pronounced and even detrimental at those velocities suggested for interplanetary "spaceships" of the future.

Although many details of the sputtering process need further clarification, it can be assumed that the basic picture is about as follows: The atomic weight, kinetic energy and angle of incidence of the target atoms determine the amount of momentum and energy that is transferred to the surface atoms of the target. The momentum pointing to the inside of the target must be reversed in direction in order to account for sputtering. This reversal takes place inside the target and a sound pulse travels from the place of impact most efficiently along closely packed atom rows. In this part of the process the sound velocities come into play.

Finally, a surface atom receives an impact from one of its close neighbors underneath, with the momentum directed to the outside. If the energy of this impact is sufficient to overcome the binding energy of this atom, and if neighboring atoms do not interfere with the direction of ejection, the target atoms clear the surface and are sputtered. The process is markedly different from evaporation and the influence of the target temperature is of only a secondary nature.

Efforts in General Mills' present sputtering work are now concentrated on:

1. Collection of more yield and threshold data, especially for gases other than mercury.
2. Continuation of ejection studies from metal single crystals.
3. Simulation of erosion conditions arising in high-velocity flight in the ionosphere and in outer space.

The final goal is to arrive at a thorough understanding of the basic phenomenon of sputtering.★

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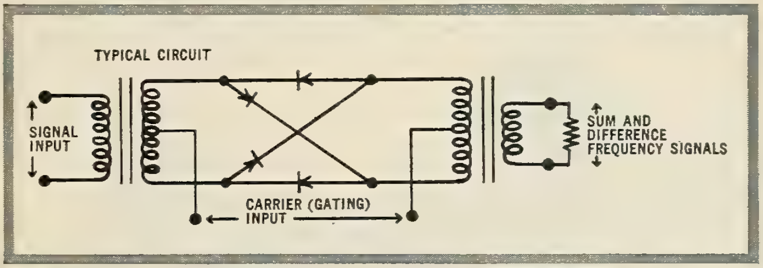
NOTE: By impressing a pulse signal on the carrier input terminals, the input signal is effectively switched (gated) on and off at the output circuit. Polarity of the switching pulse determines phase of the output signal.



SPECIFICATIONS (H.S.T. PART 956-0259-300)

DESIGN SPECIFICATIONS: MIL-T-27A, Class R, Grade 4
SIGNAL SOURCE IMPEDANCE: 1000 ohms
SIGNAL INPUT VOLTAGE: 45 volts P-P maximum
SIGNAL INPUT FREQUENCY: 1300 cps
GATING SOURCE IMPEDANCE: 400 ohms
GATING SOURCE VOLTAGE: Square Wave + 18 to — 18 volts P-P
GATING SIGNAL FREQUENCY: Square Wave, 650 cps
OUTPUT LEVEL: 0.25 to 2.0 volts P P
BANDWIDTH: 500 cps to 15 kc ± 3 db
CARRIER SUPPRESSION: 50 db minimum
SIZE: 1⅜" x 2⅝" x 2¹⁄₁₆" high
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A report to engineers and scientists from Lockheed Missile Systems—
where expanding missile programs insure more promising careers

LOCKHEED ENGINEERS DEVELOPING TRANSISTOR FLIGHT CONTROLS FOR POLARIS

Lockheed engineers are testing and developing transistor flight control systems for the Polaris ballistic missile program. Transistorization of missile control systems has been receiving top attention at Division laboratories in Palo Alto and Sunnyvale. Advantages of transistor designs over present systems include reductions in weight and space requirements.

Flight control activities cover synthesis and analysis of systems; development or procurement of necessary hardware; bench and systems testing of complete control systems; specifications of required flight test programs; and analysis of actual flight tests.

Division scientists and engineers are making many significant contributions that earn Lockheed leadership in missile development. Through their efforts, our Polaris has become the first and only solid fuel strategic ballistic missile program.

As greater emphasis is placed on missiles' role in U.S. defense, our missile projects will continue to grow. This means more career positions are open for qualified engineers and scientists—positions that offer unequalled opportunities for you to move ahead rapidly.

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Qualified engineers and scientists are invited to write M. W. Peterson,
Research and Development Staff, Palo Alto 7, California.

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Gene Schott, Flight Controls Department Manager, right, talks over results of a recent test with design engineer Carlos Avila.

Circle No. 75 on Subscriber Service C

the new look in gimbal systems

internal gimbaling tailormade for ballistic missiles

by F. K. Mueller

> Ed. Note—*Recently published pictures of* Thor *and* Jupiter *stabilized platforms (m/r, February) point to a basic difference in concept. The* Thor *platform, like most units with unlimited travel in all three degrees of freedom (as in aircraft, land and sea applications), is gimbaled from the outside in, while the* Jupiter *platform departs from convention by gimbaling on a central core (from the inside out). Here, the Deputy Director for Guidance and Control, ABMA, gives some of the reasons why ABMA chose to develop this type unit. The May issue of m/r will carry an article written by AC Spark Plug engineers detailing their reasons for using the externally gimbaled platform.*

WHEN GYROS were first employed for attitude reference in navigational systems, gimbal suspensions were built to satisfy the requirements of the airplane, ship or land vehicle on which the reference was to be used. None of these vehicles presented operational stresses to the gyro support systems much more stringent than the stationary condition. However, as a disadvantage, they had the requirement of unlimited maneuverability in one or more of the three coordinates. The designers' answer was to arrange two or three gimbal rings around the gyros, and thus the classic external gimbal illustrated in Fig. 1 came into being.

Ballistic missiles upset this neat arrangement by posing a whole new set of problems—weight, high linear acceleration with its vector changing direction and magnitude (presenting in turn the problem of isoelasticity), and vibrations of undetermined frequencies and magnitudes.

During World War II, the inertial guidance system, development of which began with the A-5 missile in 1937 in Peenemunde, was improved for use on the V-2 missile in order to replace the V-2's original autopilot and missile-fixed integrating accelerometers.

The stabilized platform for this guidance system consisted of three gyroscopes, two integrating accelerometers and two plumbline detectors, supported by a conventional external gimbal system. Although the platform had to operate only during the propulsion period—slightly longer than one minute—all the other typical ballistic missile criteria had to be met.

Early in the development stage it became apparent that a high percentage of overall platform weight would have to be allotted to the gimbal structure to cope with stresses due to vibration and linear accelerations in the order of 6g. So, an important problem was to find the most favorable gimbal ring structure. Investigations resulted in the decision to build hollow steel gimbal rings formed from sheet metal and welded together as shown in Fig. 2.

The hollow box frame gimbal was found to be superior to solid aluminum-alloy rings not only in the matter of weight, but also in respect to yield under stress.

This design, after completion and successful flight-testing, was the first stabilized platform specially designed and built in large quantities for a ballistic missile. The completed unit still featured the traditional external gimbal system. This was a workable, reliable system but studies throughout the

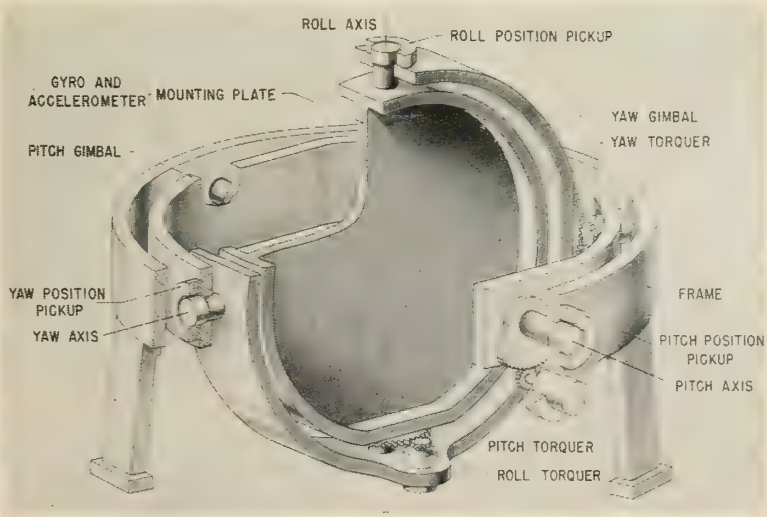


Fig. 1—External Gimbal System. Outer gimbals enclose gyros, accelerometers and other sensing elements.

Mr. Mueller is the deputy director of the Guidance and Control Laboratory, Army Ballistic Missile Agency.

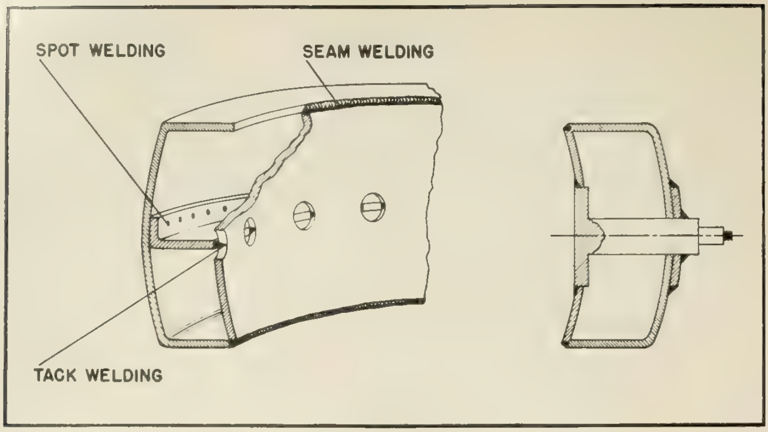


Fig. 2—Gimbal Ring Section. V-2 missile used stabilized platform fabricated in this manner.

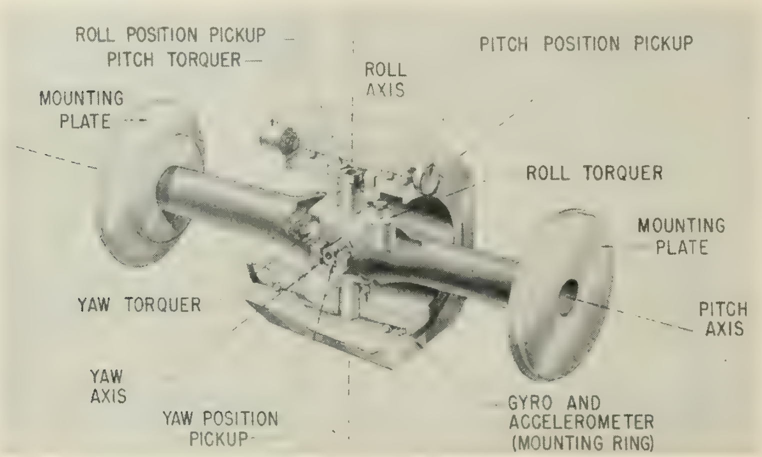


Fig. 3—Internal Gimbal System. All sensing elements are mounted on the outer gimbal ring.

years showed that, while the weight-efficiency ratio was acceptable, it would have to be improved for faster and higher-flying missiles.

A stabilized platform normally carries three types of sensors—gyros for stabilization, accelerometers (or integrating accelerometers) for guidance information and plumbline detectors for prelaunch alignment. Considering the gyros, accelerometers and plumbline detectors as the sensing components and all the other remaining elements such as gimbal rings, torquers, housing, etc., as structural components, a weight-efficiency ratio can be established:

$$\frac{\text{weight of sensing components}}{\text{weight of structural components}}$$

This ratio provides a convenient basic criterion to judge the suitability of a stabilized platform for a ballistic missile. In the case of the V-2 stabilized platform, a weight-efficiency ratio of 1:4.2 was achieved. Modern missiles with higher linear accelerations and more severe vibration can be expected to decrease this ratio even further. The size and the weight of the sensing components are mainly determined by accuracy requirements: the logical way to improve the ratio is to reduce the size and weight of the structural components.

The realization that a more favorable suspension mode was necessary provoked a long series of design and development studies by Army Ordnance and the Army Ballistic Missile Agency. These studies resulted in the internal gimbal system, tailormade for ballistic missiles. The internal gimbal system breaks with the tradition of building the gimbal around the gyroscopes and instead concentrates the kinematic features of the three-axis gimbal system into the smallest volume possible and places the sensing components on the outermost gimbal itself as illustrated in Fig. 3.

By this method stabilized platforms were produced for conditions more severe than those of the V-2, but actually attained weight-efficiency ratios of 1:1.4. After the first system of this type was built, further studies and tests, including flight tests, confirmed most of the anticipated advantages.

The overall weight and space requirements of a stabilized platform with an internal gimbal system can be kept smaller than one with external gimbals using sensing components of comparable size and weight.

The arrangement of the sensing components on the outermost gimbal makes them very accessible for calibration and maintenance and permits easy exchange of components.

The internal gimbal system features relatively rugged parts with small lever arms which results in relatively small elastic deformation under stress. This results directly in higher natural frequencies.

The simplicity of the gimbal parts permits a design of utmost isoelasticity. The importance of isoelastic features is clearly indicated by the relation for a disturbance torque, T, created by nonisoelasticity:

$$T = m^2 g^2 y \left(\frac{X-1}{Y}\right) \sin 2\alpha$$

where the mass m of the sensing components and the acceleration g appear in the second power. X and Y represent the yields in the direction of the axes of the gimbal system and α the angle between the direction of acceleration and direction of the gimbal axes. The rectifying effect of the g^2 term makes the vibration forces especially difficult to cope with. Such torques caused by linear acceleration and vibration have to be compensated.

The inner gimbal configuration results in a relatively small inertia around the stabilized axes. The ratio between this moment of inertia and the angular momemtum of the gyro influence the configuration of the servo loops. (See "How Industry Solved the Air-bearing Gyro Stabilization Problem," m/r, February.) The smaller moment of inertia permits simpler servo loops and smaller torquers.

The internal gimbal system has limited freedom in two of its axes and permits 360° freedom in one axis only. However, limited freedom in two axes is not a limitation in common ballistic missiles which require 360° freedom in one axis only.

The system is not suited to accommodate direct or ungeared torquers but again, this is not a disadvantage. On the contrary, an optimized gear ratio with its associated small torquer, amplifier and power supply can be built with only a fraction of the weight of its counterpart, the ungeared with its amplifier and power supply.

The internal gimbal system can be applied to save considerable weight and space in any vehicle which tolerates limited gimbal freedom in two axes.★

soldering in the missile age

modern applications cause new look at old techniques

by Alvin B. Kaufman

WITH TODAY'S technology advancing by leaps and bounds, the subject of solder connections is largely taken for granted and rarely accorded the importance that it deserves. The engineer is thus overlooking an important reliability parameter.

It is conventional practice among engineering writers to review the "literature" when compiling and writing a text or article to clarify or advance the "state of the art." Careful perusal of all available MIL specifications, handbooks and trade journal literature has revealed an abundance of material on soft (tin-lead) solders.

Unfortunately, review of this multitude of material has indicated redundant data which is incomplete insofar as supplying the engineer with environmental limits of the solder materials and terminal connections with which he must work.

The literature is also meager on the subject of soldering fluxes and soldering techniques. In general, however, certain publications appear to outline accurately the uses of various solders and fluxes in the electronic field. For this reason, very little mention will be made here of basic solder-flux data and soldering techniques.

Rather, this article provides for the solder user a sound and factual background underlying the fundamentals of "environmental limits" as applied to the realities of solder usage.

The environmental parameters with which the engineer must be concerned, surprisingly enough, are much broader than mere temperature or tensile strength limits. Additional parameters are methods of wire or component-solder termination or configuration, vibration, shock and effects or combinations of these conditions.

Solder fluxes are tested for cor-

The author is Chief, Development Engineering at Arnoux Corp., Los Angeles, Calif.

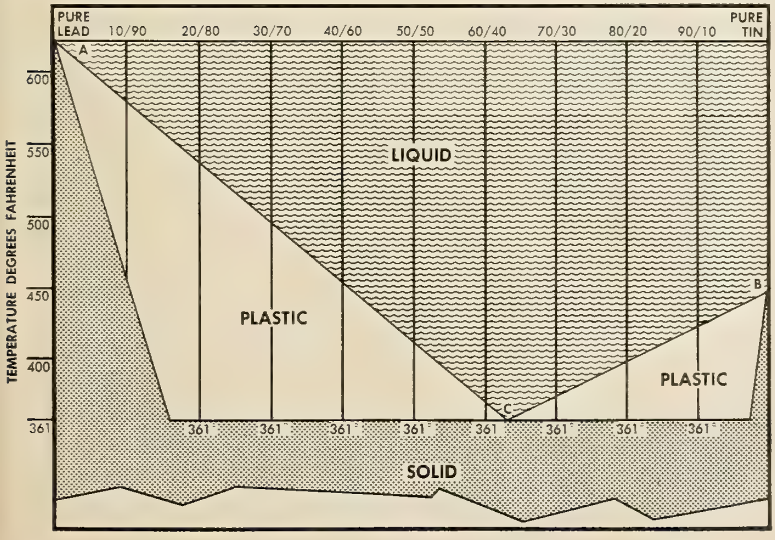
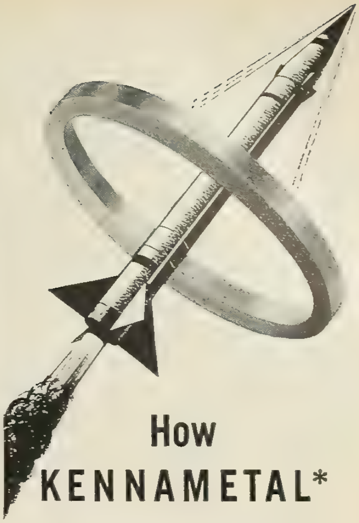


Fig. 1—Tin-lead fusion diagram.



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They state that "the Kennametal rings sealing results have been far superior with no indication of seal face wear" and that "the Kennametal ring has indications of less bending and distortion when installed between two mounting faces making assembly simpler and reducing assembly time."

This is only one of the dozens of instances in the development of missiles and rockets where getting a design off the board and into the air depended on finding materials with unusual properties. Kennametal has been usually successful in filling these needs, providing not only corrosion resistance, but heat and abrasion resistance, also.

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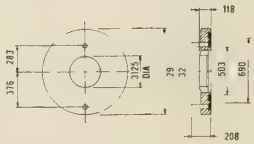

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rosion and fungus resistance per MIL-S-6872 and MIL-E-5272 respectively. The solder or its connection receives "environmental test" only incidentally during the test of equipment, as solder procurement specifications require composition and plastic or melt point certification only. Climatic environmental conditions are normally evaluated by test per MIL-E-5272A.

This specification includes testing for items such as sand and dust which are not applicable for solder reliability tests. Other parameters such as humidity, temperature, and salt spray are dubious in value. Temperature in particular is a factor in which adequate control has not been made.

Components are rated per MIL specification for environmental temperatures of 85°C with little attention paid to the associated solder connection with which the component is held in place. Additionally, I^2R heat generated in, or radiated by components may well bring solder connections close to the solder "plastic" range. Military specification MIL-R-26B indicates that power resistors at full ratings may have surface temperatures of 200-350°C (392-662°F) in free space and still air. Coupled with this is the possibility of higher than ambient internal air temperatures due to enclosure of an assembly in a rack panel or in its placement in a marine or airborne vehicle.

For the reasons indicated above, careful empirical tests to evaluate the "connection" or the use of higher temperature soft solders is advisable. It can thus be seen that cooling of equipment or solder connection parameters must now be considered as a prime design requirement, and electronic equipment must be thermally designed as well as electronically designed.

In either case, the use of an eutectic alloy solder where practical is desirable. An eutectic alloy solder is one in which there is no appreciable "plastic" or semimolten state; *i.e.,* a few degrees of temperature separates its solid and molten state.

This solder has an advantage in preventing a "cold" solder joint such as will occur by accidental mechanical movement of a lead wire while the solder is cooling down through its "plastic" range. The non-eutectic solder may have a plastic range of 50 to several hundred degrees (Fig. 1). This type of solder is commonly known as a "wiping or body" solder. As such it has many uses not connected generally with electronic soldering.

Fig. 2 indicates the comparative strength of tin-lead solder vs. alloy ratio. Note that at the 50 to 60 per cent tin ratio to lead, the highest strength alloy occurs.

These solders, however, are not

necessarily as strong as other solders at elevated temperatures, as shown in Fig. 3.

Although certain material and word of mouth indicate that 230°F is the limit of a soft (tin-lead) solder connection, no published data has been found to substantiate this claim. Fig. 3 clearly indicates the tensile strength of soft and low-temperature silver solders at various temperatures.

This data in itself is not enough to indicate a "safe" solder-termination temperature. According to one reference, "the alloy attachment lies in the this film of solder between the two metals joined together." In addition, the reference indicates that it is advisable to make a mechanical joint for strength, using the solder mainly for electrical conductivity.

At one time the author would have agreed with this statement without exception and under certain high temperature conditions this statement may still be correct. However, with the introduction of shock and vibration parameters, the picture is radically changed.

A termination, in which the component lead is held to its associated binding post by solder alone, has proven superior in resisting vibration and shock and in ease of component replacement. The test parameters included the use of tin-lead solders of various ratios, but unfortunately did not include tests of the solder joint above 200°F. This is approximately 161°F below the plastic point of tin-lead solders.

The plastic point is considered by the author to approximate zero tensile strength. With a solder joint at 200°F, considerably lower environmental temperature would have to be assumed for anything but a passive or low level power device. The solder in such a termination, at this moderate temperature, would still have approximately a 3000 psi tensile strength. For commonly used 50-50 solder, this corresponds to a 50 per cent decrease of tensile strength.

At a 300°F joint temperature (combination of 85°C (185°F) environment temperature and I^2R from a power resistor) such solder has decreased in tensile strength to about 1100 psi.

It is obvious then that, depending on component-terminal geometry, a mechanical connection or a higher temperature soft solder becomes essential at this time. The mechanical connection however does not allow the solder joint to be taken to the "plastic" solder temperature. Under vibration, at some point, solder integrity would fail due to stress transfer or outright "throwing" of solder. In addition, more rapid failure under vibration stress would occur. It appears that the solder-held termination is still superior, although it introduces a requirement in some cases for the higher temperature soft solders.

The tensile strength data shown in the graphs is not assumed to be highly accurate. Solder-alloy tensile-strength data available to the author shows a correlation of approximately 20 per cent.

Variation in this data will be found from source to source due to measurement technique variation and impurity variation between test samples. Also, tensile strength may be based on strength of the solder alone or its holding strength in relation to copper, tin or various solderable elements.

The high-temperature limitations presented above may also be altered by another effect. Certain material indicates that alloy composition changes with a temperature gradient. Correlation of this effect with tensile, bending or torsional stress is not known.

As of this time its significance to the soldered joint has not been de-

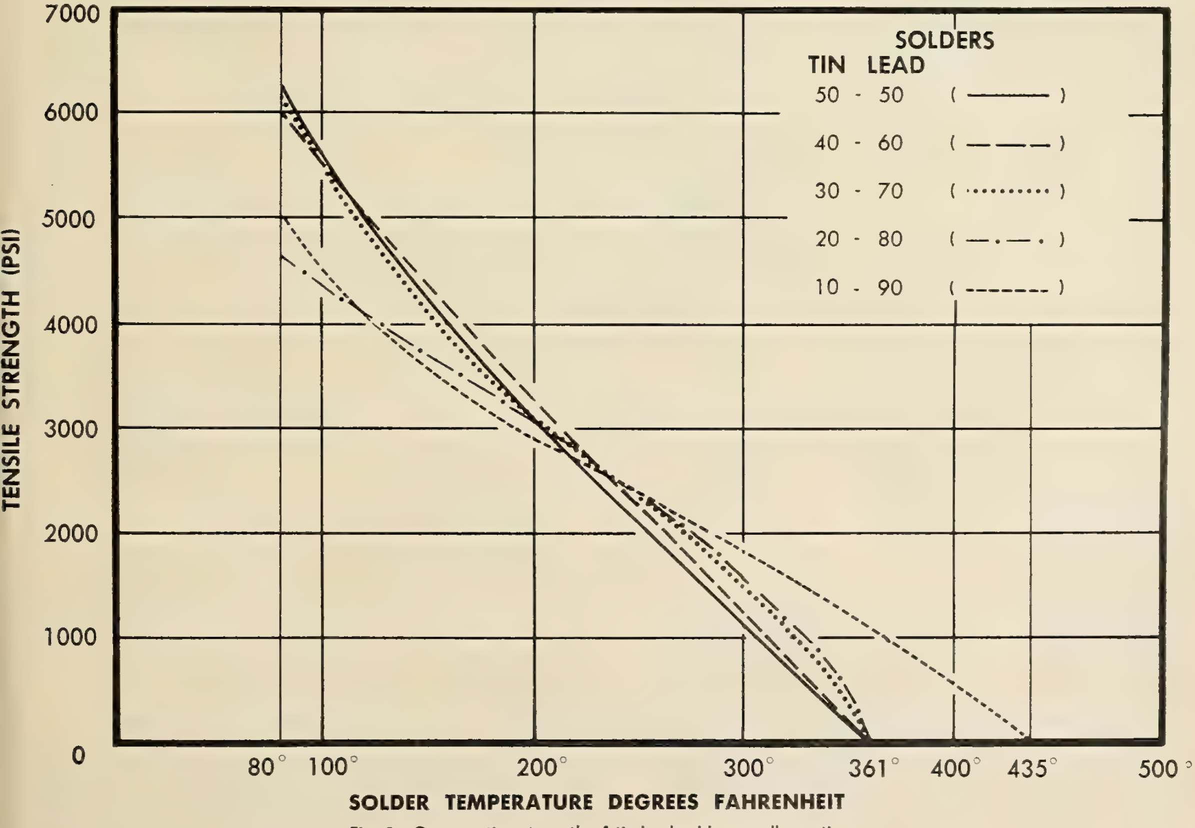

Fig. 2—Comparative strength of tin-lead solder vs. alloy ratio.

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Tin-lead Solders—Tensile Strength (psi) vs Temp.

Solder*	80°F	200°F	300°F	°F psi Plastic	°F Liquid
95-5	—	—	—	361	432
90-10	—	—	—	361	415
80-20	=5900	—	—	361	390
70-30	=6150	—	—	361	367
63-37§	=6273	—	—	361	361
60-40	=6300	—	—	361	370
50-50	6273	3090	1150	361	414
40-60	6030	3320	1275	361	460
30-70	6176	3120	1495	361	496
20-80	4640	3043	1518	361	536
10-90	5017	2917	1863	435	576
5-95	4190	2965	1782	522	597

* Tin (Sn) first figure; lead (Pb) second figure.

§ Eutectic alloys do not have a plastic range, but have a sharp and distinct melting point; *i.e.*, there is little or no distinguishable difference in temperature between the solid and liquid point.

veloped. It is well, however, to keep this parameter in view in regard to its possible ultimate effect in changing solder environmental limits.

Much attention has been paid to the upper environmental temperature limits. The lower or colder environmental limits also deserve their share of attention. Experience with solder in arctic areas has indicated that solder connections maintained for long periods at cold temperatures are subject to failure. This is due to the tin content in the solder.

Push temperature down and lead's strength goes up, with little loss in its ductility. Not so with tin. Below −18°F tin may suffer its allotropic transformation, to a brittle element. The lead-tin soft solder alloy becomes gray and crystalline in form with resultant open or erratic conductivity. Recent research shows that lead-tin solders tend to split the differences noted above in rough proportion.

A 50-50 solder, for example, produces joints with higher tensile strength at −75°F than at room temperature. But it is more brittle. At −75°F the solder is still stronger than the joined metals. At colder temperatures the solder is weaker.

Increasing the lead content of a solder lowers the temperature at which joints retain good ductility. Ease of soldering decreases, however, and the strength does not increase as rapidly as temperatures go down. Up to 15 per cent tin content has little effect on ductility. Beyond 15 per cent the loss in ductility and the lowering of impact and fatigue resistance should be considered when specifying a solder for "cold" environmental applications.

Although antimony and other elements are generally considered worthless or accidental impurities of virgin metal solders, 0.2 to 0.5 per cent antimony in 40 to 70 per cent tin vs. lead solders inhibits the allotropic change. Higher values of antimony create a hard and brittle solder.

Of course one easy way to forestall this problem is a change to a lead-silver or other higher temperature soft solder alloy; providing its higher melting point and greater difficulty of application (with non-corrosive rosin flux) is acceptable.

The use of soldered connections close to liquid oxygen or helium tanks (such as in missiles) poses a severe problem as indicated above, if long-term connection stability is required. Environmental temperatures of −297 to −453°F respectively, may be encountered on the surface of such tanks. Air environmental temperatures close to such tanks may reach −100°F or colder.

In a recent typical missile system, with which the author was concerned, components were required to operate in a −200°F air environmental temperature. The use of high-temperature soft solders was indicated in the preceding paragraph but is not the only alternate possible.

Crimped, silver solder or welded connections are also feasible for some connections. Potting of components and terminal connections, especially where internal assembly heat is developed, may negate the requirements of special solders or techniques.

The use of tin-lead soft solders internal to liquid or gaseous oxygen tanks is not suggested. A number of tin-lead alloy solders have been tested and found sensitive to impact when in contact with liquid oxygen.

At present, if a tin-lead solder connection must be made in the vicinity of liquid oxygen, it is recommended that it be sheathed in teflon tubing to prevent direct contact with the liquid or that other alloy solders be used. Note that an impact is required as the "ignitor" to cause an explosion, and that this is not too probable in most installations. In addition, some teflons

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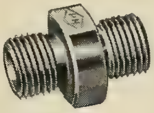

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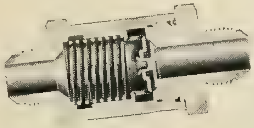

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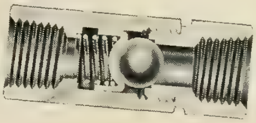
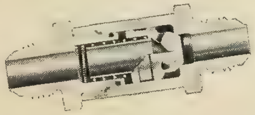


Ruggedly constructed for intermittent non-shock hydraulic service up to 500 psi at temperatures −65° to 350°F. Sizes ⅛″ to ¾″. Brass, aluminum alloy, stainless steel. Pipe and flared tube connections.



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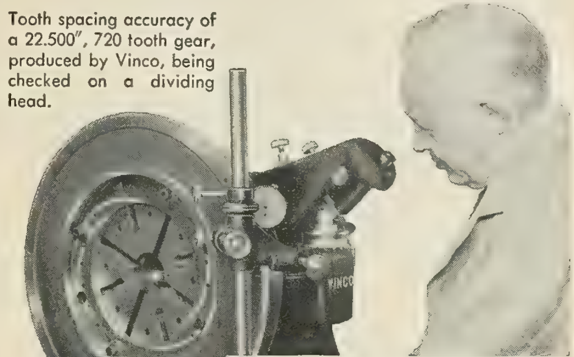

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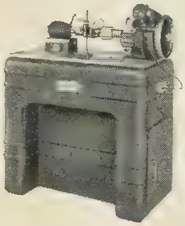
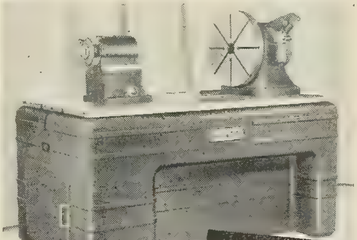


Model 55—38 is available either with a 20″ x 40″ surface plate; capacity between work centers 22″, or a 20″ x 72″ surface plate; capacity between work centers 54″. Both have a work swing of 12 7/16″ dia.



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have been found sensitive to impact under the same conditions. More specific data is not available to the writer at this time.

Although temperature vs. tensile strength of solders has been thoroughly covered, it is not intended to infer that these are the only parameters involved in selecting a solder. The overall quality of a solder is governed by numerous factors. These are speed of alloy formation, flow (or wetting) of solder, chemical stability of the soldered connection, soundness and porosity of the joint, and physical resistance to shock, strain and stress. In addition, the requirement that corrosive-type fluxes be used with some solders may rule out their use, even though excellent in all other respects.

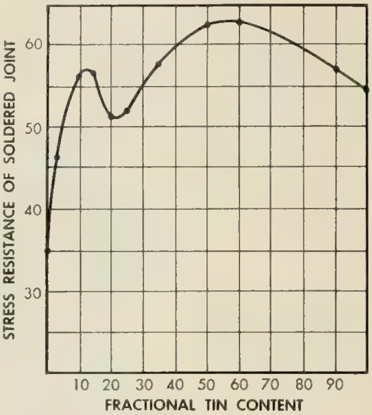

Fig. 3—Stress resistance of soldered joints vs. fractional tin content.

The primary purpose of the solder is to unite two or more metals in continuous metallic contact under environmental conditions as previously noted. Tensile strength in itself is not necessarily a complete index of quality, although Fig. 2 indicates a close corollary.

Other parameters of possible value are: Brinell hardness, elongation; torsion, bending, and compressive strength. Simulated bending-torsional stress or vibration-shock life tests will certainly have to be correlated under various environmental conditions to secure comprehensive design data for possible use in the future.★

The data in this article is not as comprehensive as could be presented, but it is hoped that it will contribute something of importance to the design engineer and additionally be a spur to greater investigation by other research agencies.

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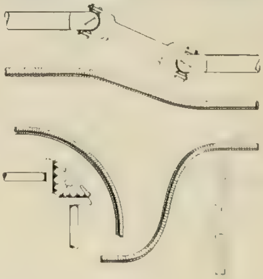

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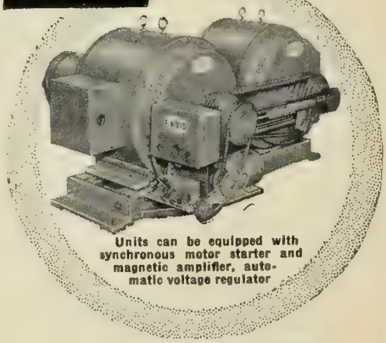

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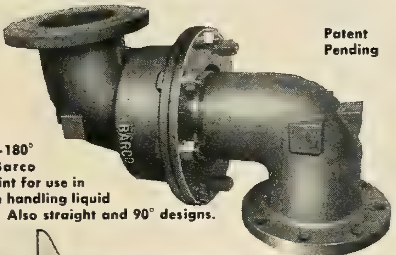

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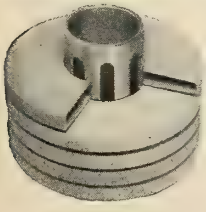

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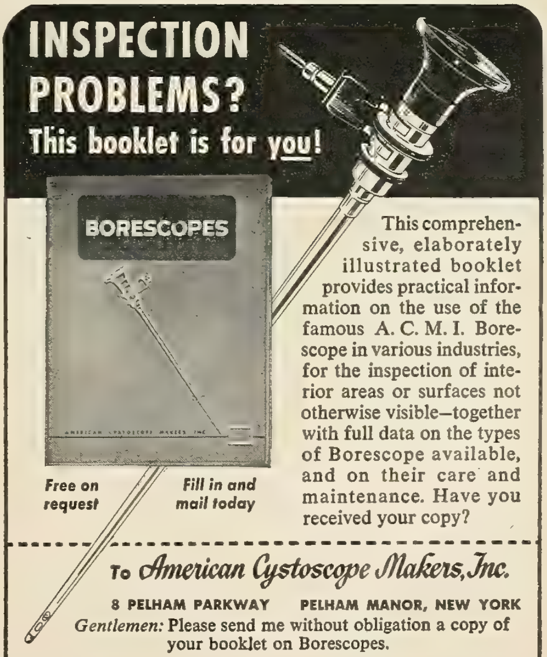

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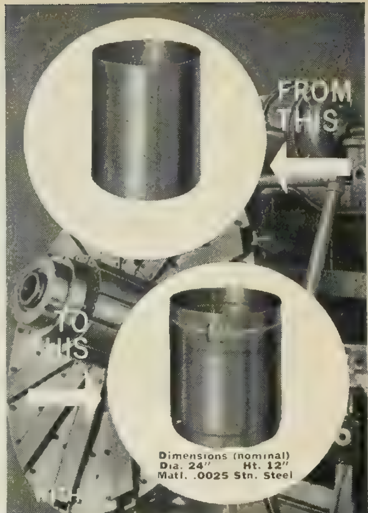

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people

Rear Adm. Jackson S. Champlin, USN (Ret.) has been appointed assistant to the director of DataTape Division of Consolidated Electrodynamics Corp.

A. C. Labrie has joined the consulting firm of Thomas Wilcox & Associates in Washington.

Myron G. DeFries has been named head of the chemistry group of Atlantic Research Corp., Alexandria, Va., and **Kenneth D. Johnson** has joined the firm as staff assistant to Vice President **Keith E. Rumbel.**

Richard N. Goldbach has been appointed to the newly created position of vice-president in charge of marketing for the semiconductor division of Hoffman Electronics Corp.

Dr. Theodore K. Steele has been named vice president of research and engineering and **Oscar Brockmeyer** has been named vice president of engineering sales for Bulova Research & Development Laboratories.

E. U. Da Parma has been appointed executive vice president of Sperry Gyroscope Co. He formerly was vice president for operations.

D. M. Heller and **R. E. Whiffen** have been appointed assistant general managers and **W. P. Bollinger** has been named director of engineering of the products division of Bendix Aviation Corp.

A. R. Teasdale has been named to the newly created post of director of advanced technology at Temco Aircraft Corp. He formerly was chief of avionics.

James S. Arnold, a physicist at Stanford Research Institute, has been elected vice president of the Northern California section of the American Rocket Society.

Five persons have joined the staff of recently formed Data-Control Systems Inc. in Danbury, Conn. **F. E. Farris,** now assistant to the president of the firm, was formerly with Philips Electronics Inc. as assistant sales manager. Others are **David Zeller** and **Joseph H. Marchese,** research engineers; **Owen J. Ott,** senior research engineer; and **Clark A. Denslow,** industrial engineer.

Charles H. Kenerson has been appointed eastern district customer relations manager in charge of Marquardt Aircraft Co.'s Dayton office. He succeeds **Paul J. Papanek,** who becomes assistant director of customer relations at the firm's main office.

Col. Frank M. Fazio has assumed command of the Air Research and Development Command's liaison organization.

Herbert C. Langmore has been named manager of special products for North American Aviation's missile development division. He has been project engineer for the X-10.

E. A. Bellande has been placed in charge of foreign operations and support services for the Garrett Corp.

Dr. Louis N. Ridenour, head of research for Lockheed missile systems division, has been appointed to the Air Force's Scientific Advisory Board.

Sud-Aviation Corp., a U.S. firm representing the French aircraft/missile manufacturer, has the following officers who are also directors: **Claude J. Teyssier,** president and treasurer; **Alexis C. Coudert,** vice president; and **George F. Mason, Jr.,** secretary.

George M. Ballee has been appointed vice president and director of sales for the Electro-Snap Switch & Mfg. Co.

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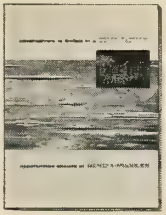

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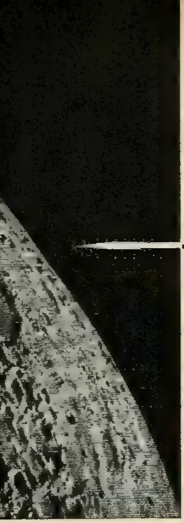

missile miscellany

Washington's beginning to come to life again: Army's General Daley recently quipped that "Now we've got a missile with a range of 400,000 miles a day." Jupiter-C, of course, and its Explorer payload. And Defense Secretary McElroy, in appointing GE's Roy Johnson to head up the new Advanced Research Projects Agency, said that he saw no reason for Johnson to sell his GE stock; that he couldn't see any conflict of interest. With hundreds of millions of dollars in defense contracts, of which a healthy hunk is missile and space-flight related, this page wonders just how Mr. McElroy would define "conflict of interest."

Then, there's usually cogent Assistant Navy Secretary for Air Garrison Norton, who recently told Congress that Jupiter-C was "very, very expensive and rather inefficient." If Vanguard manages to get its scheduled six 20-inch spheres into an orbit—which isn't at all certain yet—each will have cost the American taxpayer an absolute minimum of $18.3 million each. And, when we're all through, there isn't any other practical use for Vanguard. Any thought of using the complex beast as an IRBM is preposterous to contemplate.

In contrast, Jupiter-C was developed and paid for as an essential tool in the development of the intermediate-range ballistic missile, Jupiter. Similarly, AF had the X-17 for its Thor and Atlas development work. Jupiter-C as a satellite launching vehicle was a pure bonus to the taxpayer—its research and development cost having all been written off previously for military work. The bare bird itself—one Redstone plus 15 Scale Sergeants plus special engineering on the fourth stage—could not have cost more than $1 million, which seems to dump Norton's cost claims.

As for efficiency, the record speaks for itself. Vanguard is a two-and-a-half-year-old project. When Explorer went into orbit it was, as a satellite project, less than three months old. How do you define efficiency, Mr. Secretary?

If you've ever wondered really whether the missile business was big business or not, perhaps this little statistic will be a helpful indicator: Redstone Arsenal, Huntsville, Ala., used 7,531,258 kilowatts of electric power during December 1957.

Then, there was the case of Senator Irvin listening to General Schriever who finally stopped the ballistic missile general with: "Pardon me, General, but this sounds like unscrewing the inscrutable."

One authoritative estimate concludes that within 10 years Russia will have to launch 50,000 nuclear warheaded missiles at varying ranges in order to knock out all the West's retaliatory bases, assuming a 10-megaton H-bomb in each missile. Only a fraction of these would so poison the air with radioactivity as to destroy the population of the Soviet Union—and everybody else in the world as well.

And now quick and fast—Wandering about with Lockheed Missile Division engineers, this page learns that Thiokol, as well as Aerojet-General, will share in production of solid-propellant motors for Navy's Polaris fleet ballistic missile; that 16 will be carried in each submarine . . . Army's angling to build an ICBM based on an improved Jupiter . . . AF's in the mood to build a solid-propellant ICBM, perhaps using Thiokol Big-B technique to make a single-motor first stage . . . Astrodyne (Phillips-Rocketdyne) has sent a proposal to the AF to build up production of an improved MB-1 rocket to hundreds of units a month . . . The weight of destruction from missile nuclear warheads is now down to a point where it's less than half a ton per megaton.

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NEW PRODUCT BRIEFS

ACCELEROMETER. A self-generating, dynamic accelerometer, capable of handling accelerations to 1000 g's has been developed. The unit is designed for applications where high-frequency transients or step-function inputs are expected, and operates over a frequency range of 3 cps to 60 kc. It has a flat response of ±6% between 5 cps and 40 kc. Acceleration range is from 0.01 g to 1000 g's. Acceleration of 5000 g's causes no damage and a 200-g steady-state acceleration will not affect specifications. Transverse response is 5% or less. Consolidated Electrodynamics.
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PNEUMATIC VALVE. Dual-lever emergency pneumatic valve operates on an inlet pressure of 3300 psi and applies differential pressures from 0 to 1000 psi, depending on the force exerted through each of two operating handles. Weight is 2.4 lbs. Walter Kidde & Co., Inc.
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FLEXIBLE COUPLINGS. Connection provides flexible coupling for miniature electromagnetic clutches and brakes. Made in 2 stock models and in 2 sizes for each model ranging from 15/16" o.d. to 1 5/16" o.d. for shaft diameter from 1/8" to 1/2". Dial Products Co.
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POWER SUPPLY. Model KM93B silicon rectifier power supply provides a stepless controllable output of from 0 to 32 volts dc with a continuous-duty full-load rating of 40 amps. Ripple is held to within ½ of 1% throughout the range of the equipment. Safety factor allows for continuous operation at 125% of rated current. Cooling is by convertion. Voltage regulation from 1/10 load to full load does not exceed 12% at 32 volts output. Opad Electric Co.
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HYDRAULIC TEST STANDS. Series KC-300 universal hydraulic test stands, providing performance data for all types of hydraulic system components and accessories, has been developed and is being produced by Kahn & Co., Inc.
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AUTOMATIC COATING. Maximum control of heater wire coating used in the manufacture of electronic tubes is afforded by an automatic machine which controls the thickness of insulated coating applied to heater wire. The developer of the machine, Sylvania Electric Products Inc., is using it in production.
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TRANSISTOR SOCKET. A new Teflon-insulated transistor socket for missile guidance and electronics applications is now available. The sockets, of compression-mounted design for assembly time and cost saving, are also suitable for subminiature tubes with in-line leads and are applicable to printed circuits. Fluorocarbon Products, Inc.
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DIGITAL RECORDER. A digital recorder printing 11-column digital information at rates to 5 prints per second has been introduced. Primarily designed to make permanent record of electronic counter readouts, the device is also usable with two or more counters simultaneously, digital voltmeters, time recorders and flowmetering equipment and systems such as telemetering installations and engine test stands. In addition to the printed tape record, the instrument, model 560A, provides an analog current or voltage output to drive a galvanometer or potentiometer strip chart recorder or to provide a servo control. Hewlett-Packard Co.
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PRINTED CIRCUIT CONNECTORS. PC board receptacles of one-piece body construction available in either type GR and MFE mineral filled phenolic, MDG diallyl phthalate or CFG general-purpose phenolic. Receptacles have new contact design to prevent board-to-contact damage. H. H. Buggie, Inc.
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NYLON TUBE TRUNK. Flexible trunk consisting of color-coded nylon tubes clustered within tightly braided stainless-steel sheath. Available in lengths up to 1000 ft., lightweight, and handles high pressures. M & Q Plastic Products.
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BALANCING MACHINES. A new line of Rava electrodynamic balancing machines has been introduced for production and short-run balancing. The machine employs an electrical measuring system and both the angle and amount of imbalance are determined by adjustment of electrical controls. Tinius Olsen Testing Machine Co.
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FLEXIBLE AIR DIELECTRIC CABLE. Cable used to check out missile radio-frequency systems in preflight tests. Product forms closed circuit over which interrogation and response signals are transmitted on ground. Andrew Corp.
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MISSILE LITERATURE

FUELS AND LUBRICANTS. Five reports of fuels and lubricants research conducted for the Armed Forces, including a study of the effects of gamma radiation on organic fluids, have been made available through the Office of Technical Services of the Department of Commerce.

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MONITORING SYSTEMS. Remote-area monitoring systems are described in a 4-page bulletin covering basic units in the systems and giving specification data on ranges, response, accuracy, stability, dimensions, weights and suggested uses. Victoreen Instrument Co.

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MICROMATION PRODUCTS. Plug-in servo repeater systems, subminiature servo amplifiers and other products are described in a series of file folders and specification sheets available from Waldorf Instrument Co.

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ROTARY SEALS. A booklet describing the principle of retaining gases, oils or other liquids under pressure shows typical sealing problems encountered in machine design. The 12-page text is supplemented by illustrations and cellophane overlays. Rotary Seal Division, Muskegon Piston Ring Co.

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LITHIUM. Facts and figures on lithium and other alkali metals are available in a 24-page brochure featuring charts and other illustrations. Covers principal sources, developed and undeveloped, in the world. Current prices, principal uses and producers are also covered. Montgary Explorations Ltd.

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FOAM METAL. Development of techniques and equipment which produced a satisfactory metal foam for sandwich construction is described in this three-part report for the Air Force, just released for industry. Entitled "Foamed Metal Low Density Core Material For Sandwich Construction," the publication is available through the Department of Commerce's Office of Technical Services.

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HIGH-TORQUE MOTOR. Design features, specifications, dimensional drawings, photos and exploded views of a new high-torque motor, described in a data sheet, are now available. Motor operates over a temperature range of −100° to 500°F at 60 or 400 cycles ac or pulsating dc. Starting and stopping time is a microsecond and starting torque is equal to running torque. Viking Tool & Machine Corp.

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DIAL SCALE CATALOG. An illustrated catalog showing different types of dial scales and related accessories and specifications covering dial graduations, capacity, platform dimensions, and other data has been published by the Howe Scale Co.

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INSTRUMENTS. Phase meters, impedance, vacuum tube voltmeters, amplifiers and numerous other instruments are described in a brochure covering the complete line of instruments produced by Acton Laboratories, Inc.

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POWER TRANSMISSION. New concept in power transmission is detailed in a brochure citing it as being particularly suited to design requirements of linear actuators, hermetically sealed pumps and valves and large-ratio speed-reduction devices. Technique is believed to be the first to utilize a controlled deflection wave for positive transmission of power and information. Numerous applications described. Research Division, United Shoe Machinery Corp.

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TAPES AND RESINS. Application information and specifications for pressure-sensitive electrical tapes and epoxy resins for electrical insulations are listed in a 32-page guide book and catalog. Contains physical and electrical properties, suggested applications and application procedures, data for choosing correct product, recommended tests for corrosion, guides for choosing electrical tapes, temperature limitation charts, and other data. Minnesota Mining and Manufacturing Company.

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PNEUMATIC TRANSDUCER. Operation of the pneumatic transducer, an electromechanical device for instantaneously converting 3-15 psi input pressures into ac signals, is explained in a catalog sheet published by Fischer & Porter Co.

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PRINTED CIRCUITRY. Brochure on printed circuits containing full descriptive data on materials, specifications, design tolerances and application information. Printed Electronics Corp.

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HIGH-PURITY METALS. Information on ordering and purchasing ultrahigh-purity materials for semiconductors and soft-solder preforms for automatic soldering is contained in a booklet published by Alpha Metals, Inc.

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FLUID POWER DIRECTORY. The 1958/59 edition of this directory is available at $6.50 in five sections covering fluid power components, trade names, manufacturers' catalogs and sales outlets, fluid power design and local fluid component suppliers. Industrial Publishing Corp.

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BLIND RIVETS. A 16-page catalog and three bulletins describing applications for a new line of drive-pin blind rivets are now available. The low-weight, high-strength rivets are used to solve blind-side clearance problems in fabrication. The illustrated 2-color catalog presents technical data, typical design applications, dimensions and weights for the full line of stainless-steel rivets produced by the Deutsch Fastener Corp.

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METALLIC POWER RECTIFIERS. An illustrated 32-page guide to metallic power rectifiers, utilizing germanium, silicon and selenium semiconductors, has been published. The guidebook covers applications for rectifier equipment such as anodizing, battery chargers, electrocleaning, electroplating, ground power supplies and complete semiconductor power conversion systems for the operation of electrolytic cells. Sel-Rex Corporation.

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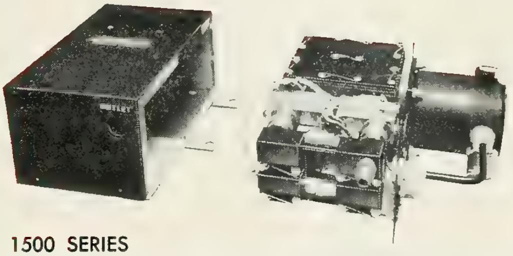

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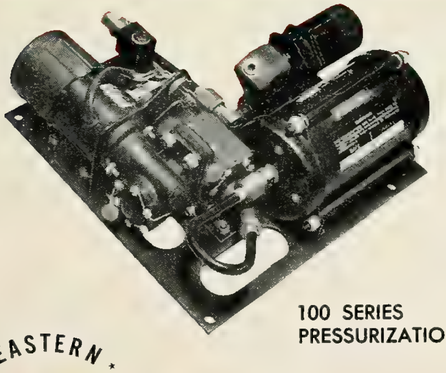

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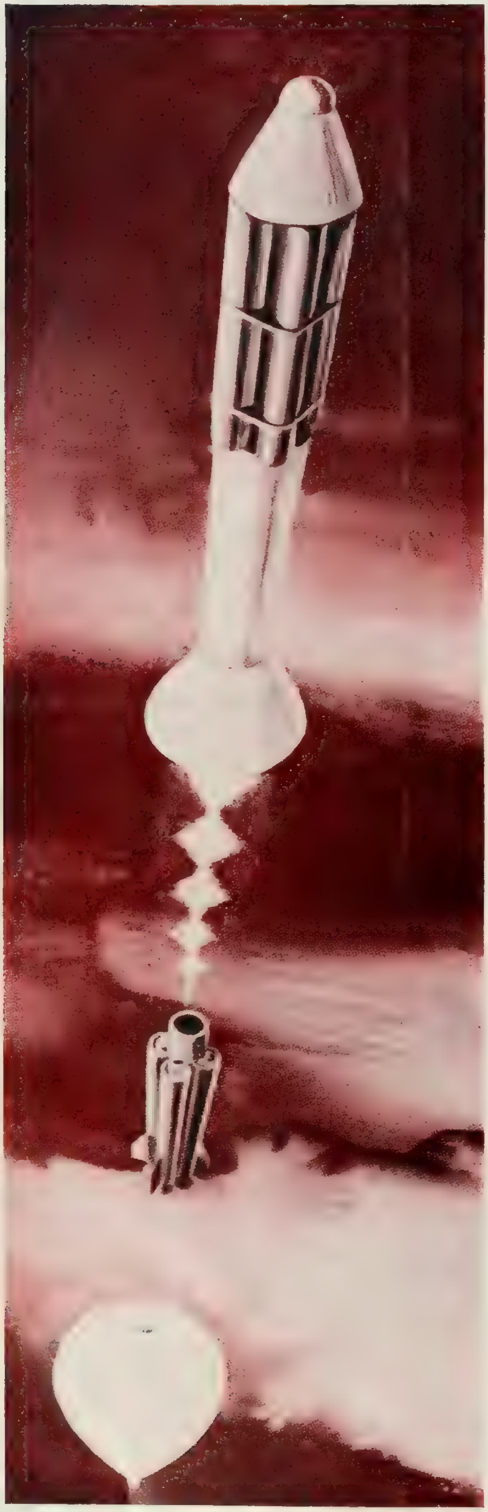

Grand Central Rocket Sets Altitude Record in "Operation Far Side"

The Air Force has confirmed that it recently fired a rocket to a height of more than 4,000 miles above the earth's surface. The 1900-lb. research vehicle with its $3\frac{1}{2}$-lb. instrument package was launched from a balloon-supported platform, 20 miles above Eniwetok atoll in the Pacific.

Ten solid propellant rocket engines powered the multi-stage missile on its mission into outer space at a velocity in excess of 17,000 mph. The third stage consisted of a cluster of four Grand Central ARROW II rocket engines, and the fourth and final stage of a single ARROW II.

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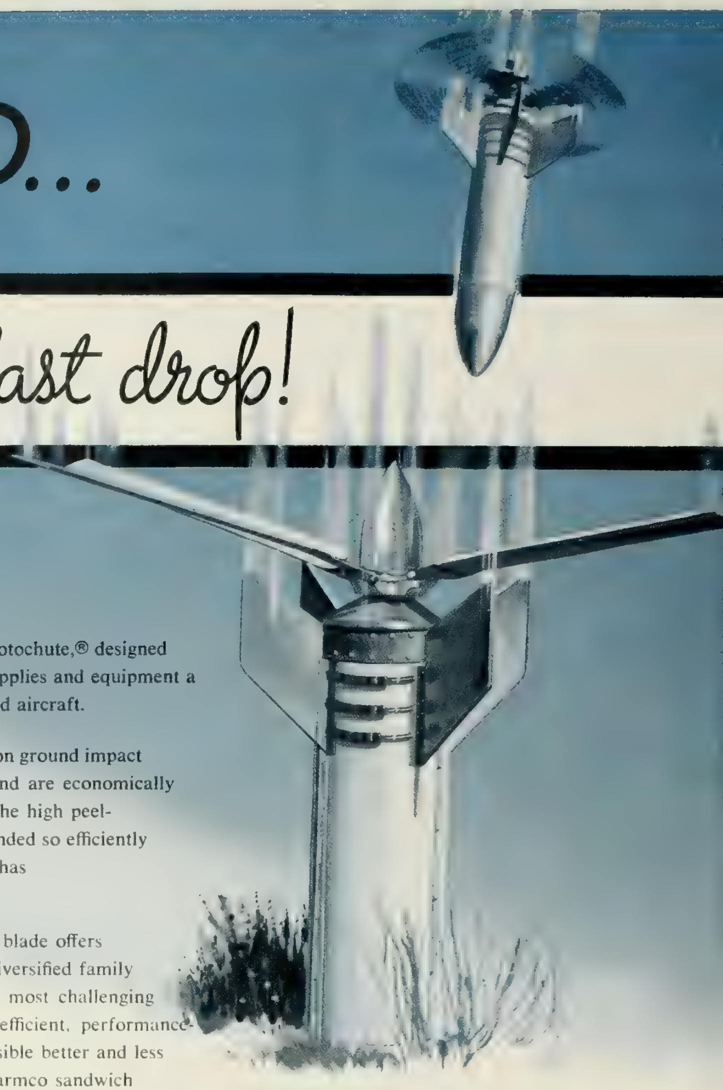

The U.S. Marine Corps' efficient new Rotochute,® designed and built by Kaman Aircraft Corp., gives supplies and equipment a quick, safe drop from a low-flying, high-speed aircraft.

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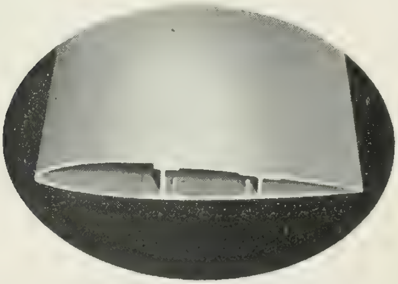

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It fabricates Bondolite, the bonded structural sandwich material which can give strength without weight-penalty to their airframes.

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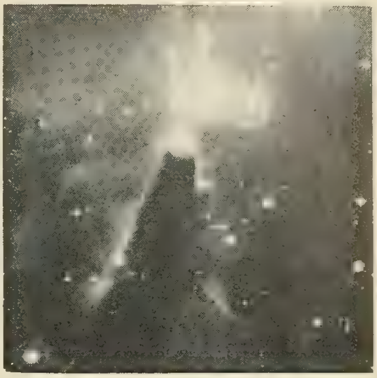
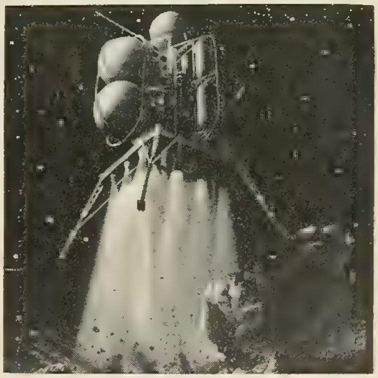


Many light years' travel away, in the far reaches of our galaxy, is the constellation Monoceros. This cluster of stars and cosmic dust, east of Orion, may some day be the goal of space explorers. Even then, many years will be required to make the round trip. The nebulosity in Monoceros was photographed in infrared by the 200 inch telescope at the Palomar observatories.



Japanese science artist Itokawa visualizes an unmanned rocket vehicle landing on the moon. Electronic and guidance devices will be needed to insure that such vehicles go where they are aimed, unfold landing legs and activate reverse-thrust rockets as required. Perhaps such projects are more a challenge to the electronics and guidance industry than to the propulsion experts.

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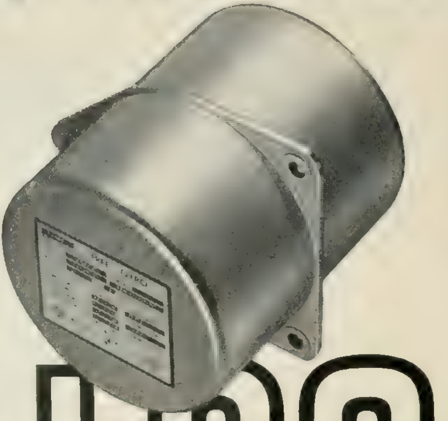

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Magazine of World Astronautics

April, 1958 Volume III, No. 4

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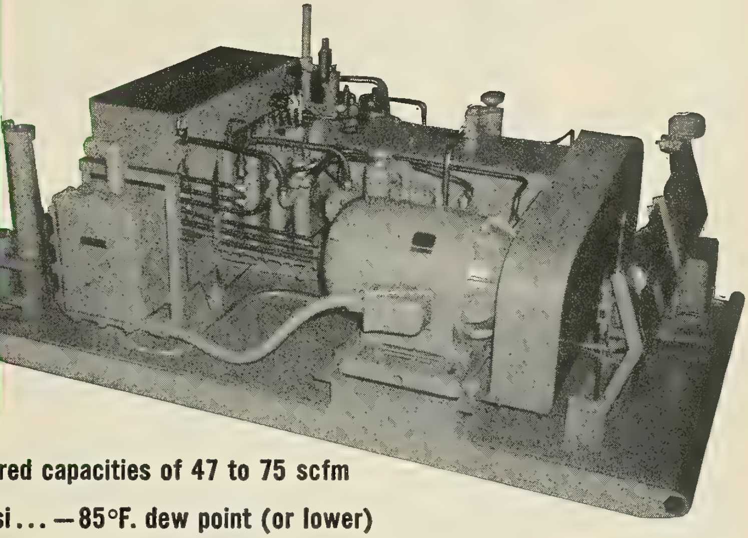

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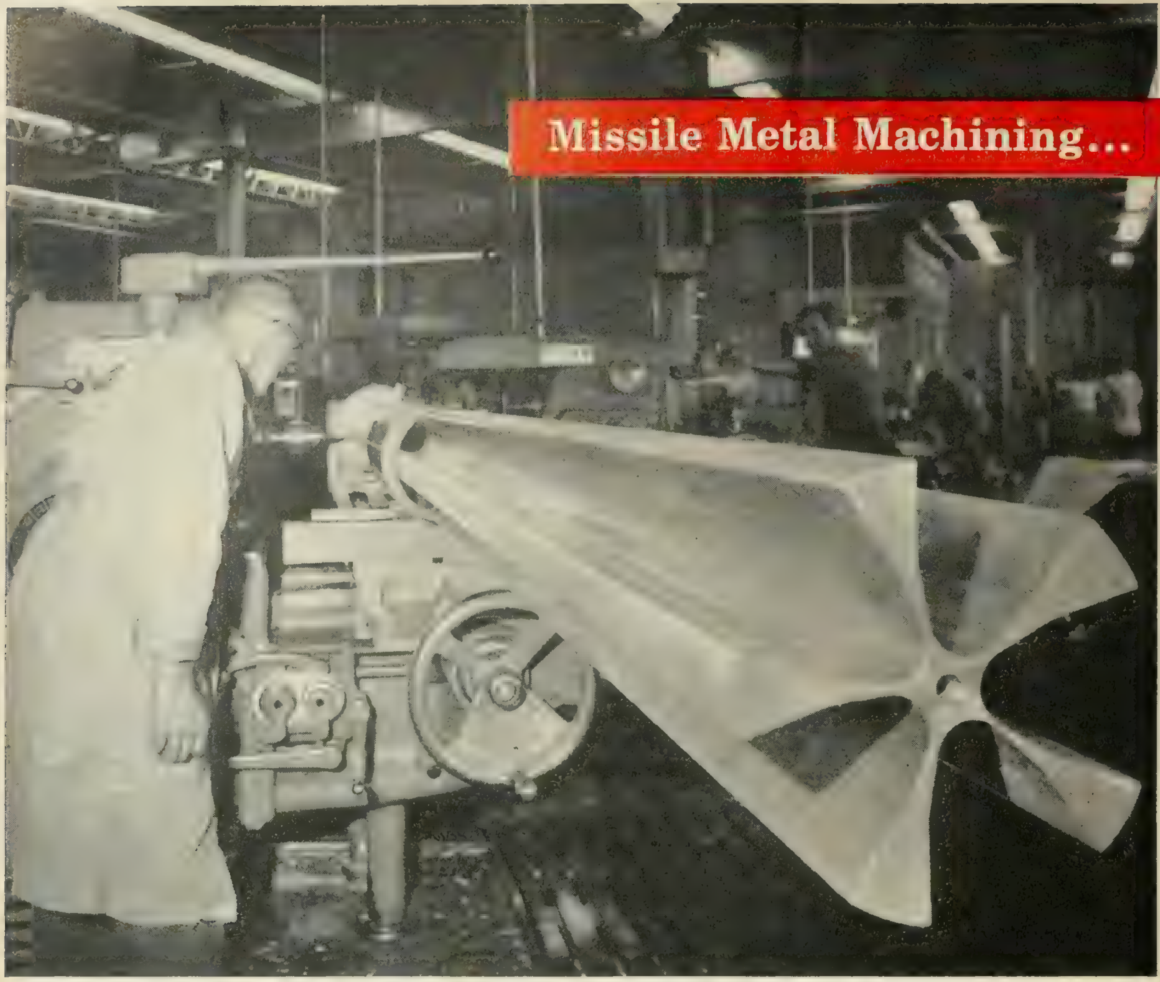

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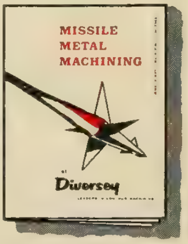

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We're Falling Behind Again

The attitude of the Administration toward our missiles and rockets programs can be summed up in two words: impractical and inadequate. As for its attitude toward nuclear rocket research, there is only one word: calamitous.

We are falling behind again—in the face of the harsh news from Russia (see page 37) that its first atomic-powered airplane will be flying soon.

One thing is crystal clear: the fact that we possess both the knowhow and the ability to build a nuclear rocket. Scores of nuclear scientists at the recent ARS meeting in Dallas and at the Nuclear Congress in Chicago agreed that we have been extremely slow and much too hesitant in getting any atomic rocket program under way. They assert that this country could have had a working test model of an atomic rocket powerplant today if we had activated some of the ideas and proposals submitted by our nuclear experimenters some five years ago.

It was generally known at the time that the Russians were progressing rapidly in the nuclear rocket field. But our national leaders exhibited an inexcusably disinterested, outright perilous attitude. Not only was it considered ridiculous to talk about nuclear-powered aircraft (and practically all work on such projects was ordered to a halt), but anyone who discussed openly the feasibility of nuclear rocket propulsion was labeled a dreamer—probably because the only imminent application of such systems was for space flight!

Rep. Carl T. Durham (Democrat, North Carolina) and Chairman of the Joint Congressional Committee for Atomic Energy, struck a solemn note at the recent Nuclear Congress in Chicago when he declared that civilian control of the military atomic energy and outer space programs is being endangered by crippling efforts of the military to enhance its role in both projects.

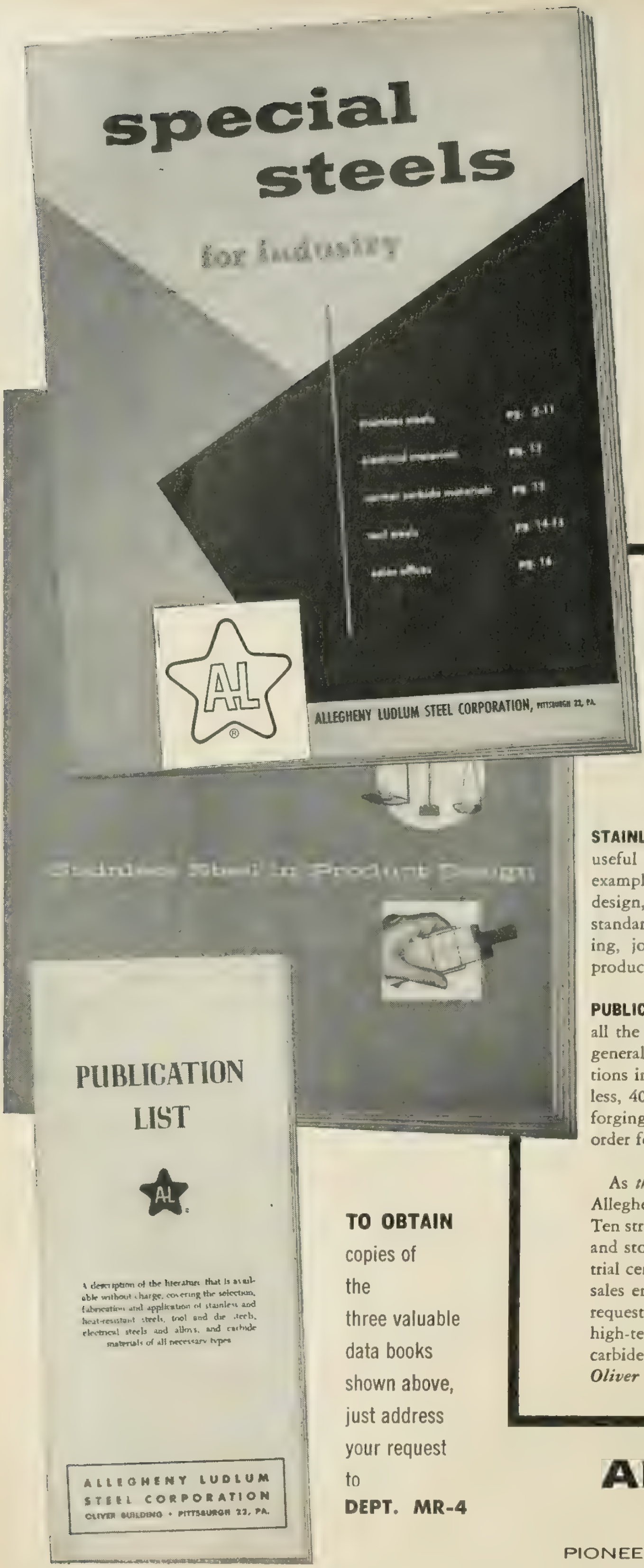
Two years ago Russian rocket researcher and physicist G. Nesterenko outlined in much detail drawings of an atomic rocket engine. More recent technical papers and numerous official statements by other reputable Soviet scientists clearly indicate that a substantial amount of work is being conducted in this field in the Soviet Union. In the meantime we continue to discard the importance of such work and are doing little or nothing about it.

It's almost unbelievable that it took a *Sputnik* to speed up America's satellite program. Even more fantastic is the thought that we must wait for the first flight of the Russian atomic airplane to understand the necessity for the stepping-up of a nuclear aircraft and rocket powerplant program in this country.

The administration didn't have any valuable explanations when the *Sputniks* were launched; there were numerous speeches and lots of talk about America moving ahead. There was agreement that we needed a scientific advisor at cabinet level, that we must establish a space flight agency, reorganize our educational system and pay more attention to our scientists. The situation, it was agreed, was alarming. Yet little or nothing tangible has been done to correct it.

Probably the American public accepted the sorry news about Russia's rocket advances as a bitter fact that you just couldn't blame anyone for—*maybe*. But we doubt that anyone will accept any more Russian technological victories such as a nuclear airplane, an atomic-powered space rocket or a rocket to the moon. We already have fallen far behind. Another technical defeat may leave us behind forever.

Erik Bergaust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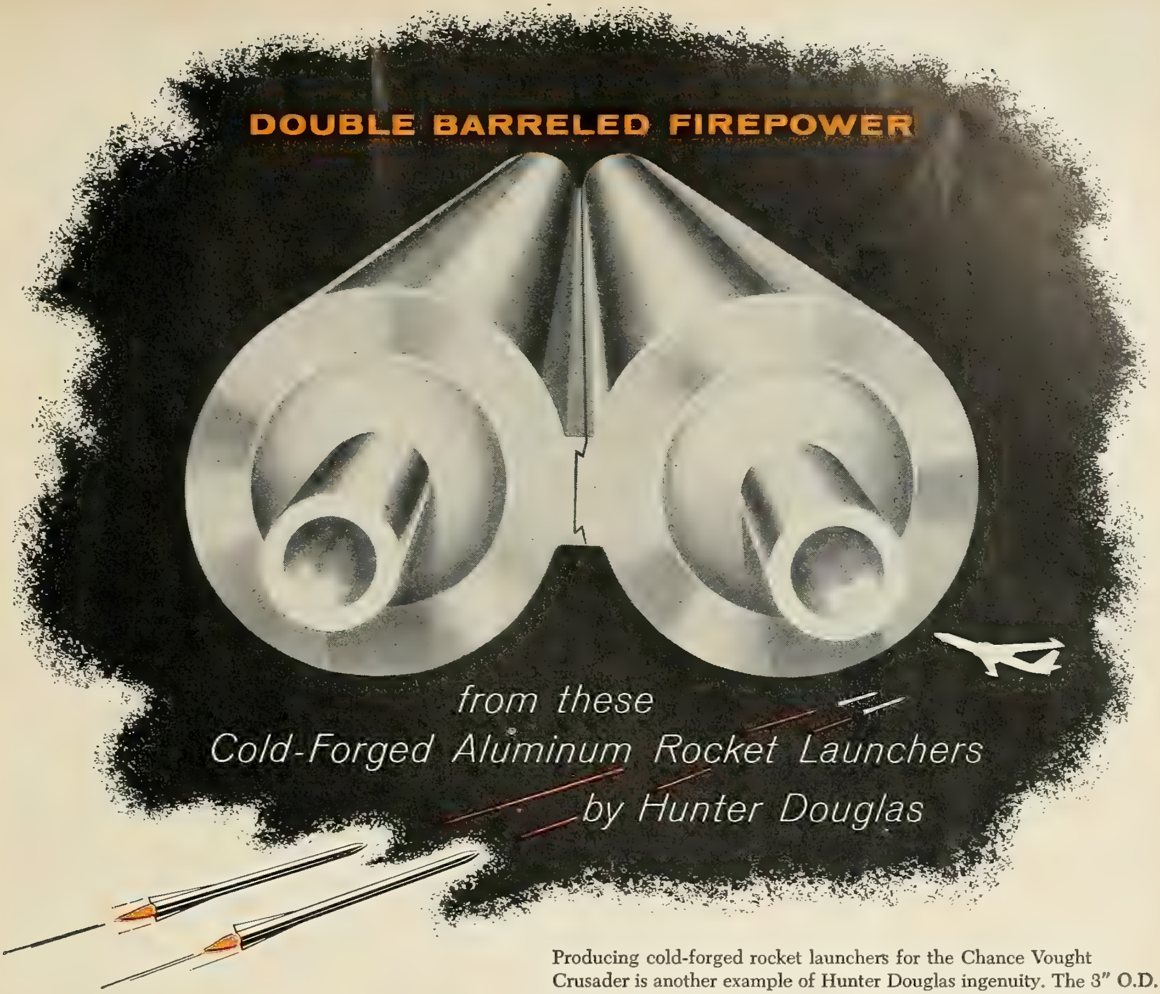


from these Cold-Forged Aluminum Rocket Launchers by Hunter Douglas

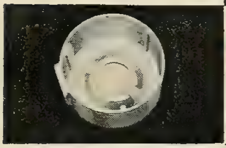
Producing cold-forged rocket launchers for the Chance Vought Crusader is another example of Hunter Douglas ingenuity. The 3″ O.D. tube, approximately 100 inches long with an .046″ wall, with one end closed, required a fantastic arrangement of internal and external longitudinal ribs, almost impossible to fabricate by conventional methods.

Even cold forging with its ability to integrally form complex part geometry, was put to rigorous tests. For example, cross sections of the tubes were non-symmetrical, generally a serious taboo in cold forging techniques. Further, the non-symmetrical design aggravated longitudinal bow, yet tubes had to be straight within .120″ overall. Finally, retention of a minimum wall adjacent to the heavy section presented the problem of uniform metal flow. The heat treated tubes must withstand 1400 psi hydrostatic pressure without deformation.

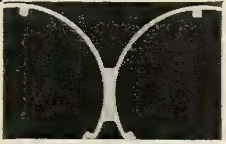
By combining the varied talents of an experienced engineering staff, good tooling design and sound production techniques, the *cold forged rocket launcher is a fact today*... assembled from two cold forged tubes mechanically joined by a dovetail. Simpler and lighter in design, the cold forged launchers are built to closer tolerances, with greater strength *at less cost!*

If your components can be cold forged, Hunter Douglas can do it! For recommendations, submit your prints or samples.

Section is removed to show internal detail of closed end.



An end sawed from the full length tube illustrates internal and external ribs as well as end detail.



Joining the twin barrels was solved by a dovetailing operation. The wide external rib seen in Fig. 2 provides dovetail area.

Overall tube length is indicated here. Entire unit is one piece. Dovetailing is the only assembly operation required.

Hunter Douglas HD Aluminum

Division of Bridgeport Brass Company
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Washington Trends

by Elizabeth Oswald

Navy needs a breakthrough improving air search radar capability substantially if missile cruisers are to do their job. What's wanted is a lightweight antenna which can be handled by mechanical means. Otherwise, use of missiles for cruisers and destroyers will be limited. Navy has an industry committee working with BUShips specialists trying to solve the problem.

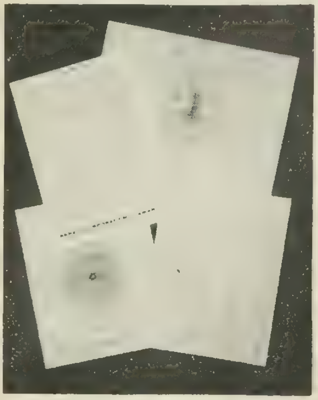
One approach to the solid-propellent breakthrough is to add aluminum powder to composite fuels, according to RAdm. F. S. Withington, long-time chief of the Bureau of Ordnance. More than 15 percent powder is being added by at least one company. Heat generated with the addition of the powder makes the fuel almost too hot to handle with current materials. However, use of the powder described as finer than cigarette ash provides a substantial boost in energy.

First two bases to be equipped for handling the Air Force's *Goose,* decoy missile built by Fairchild, have been designated. Some $10 million will be spent on developing Ethan Allen AFB in Vermont and Duluth Municipal Airport in Minnesota.

Battle between metal and plastics manufacturers may be brewing as a result of the apparent decision of Army Ordnance to stay with metal boosters for *Nike-Hercules* despite the reportedly successful firing of more than 150 fiber glass boosters for *Nike-Ajax* which are frangible, breaking up like clay pigeons after burnout. Argument is that the glass fiber boosters are cheaper, use no critical material and provide no danger of injury to people and property when the boosters drop off. Growing feeling is that interservice rivalry at development and research levels is being overplayed. Real competition exists in cloudy areas of roles and missions, with each service fighting to preserve operating functions. Record indicates cooperation between services on many research projects, the outstanding example being the work of the Navy and Air Force with the National Advisory Committee for Aeronautics.

Chances are that Dr. James Killian, Jr. will recommend establishment of a new space agency, under civilian control. Proposal won't necessarily affect the role of Advanced Research Project Agency as a coordinating agency within Defense Department but should stop any plan to make ARPA a kind of super new governmental service.

Indications are that any new agency would lean heavily on existing facilities and personnel of the National Advisory Committee for Aeronautics and its well-established techniques for working with the Army, Navy and Air Force. Future of ARPA will be raised again when Congress starts marking up the Defense Appropriation Bill for fiscal 1959.



An Engineer Speaks Out...

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The Complex Plane Conversion Chart, Worksheet #104, should be particularly helpful. On it are plotted the loci of constant closed-loop gain (in units of voltage ratio) on the horizontally axial circles, and the constant-loop phase (in degrees) on the vertically axial circles. These loci are plotted over Cartesian coordinates, the ordinate of which represents the unreal, and the abscissa the real, component of the gain vector.

Suggestions for an uniform procedure in working up the different curves are included.

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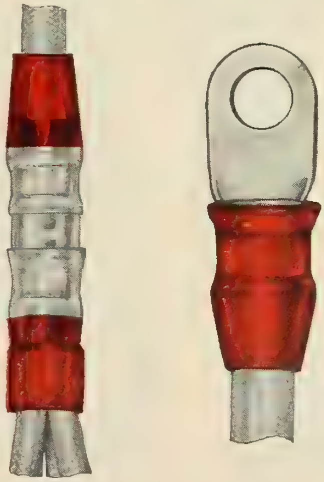

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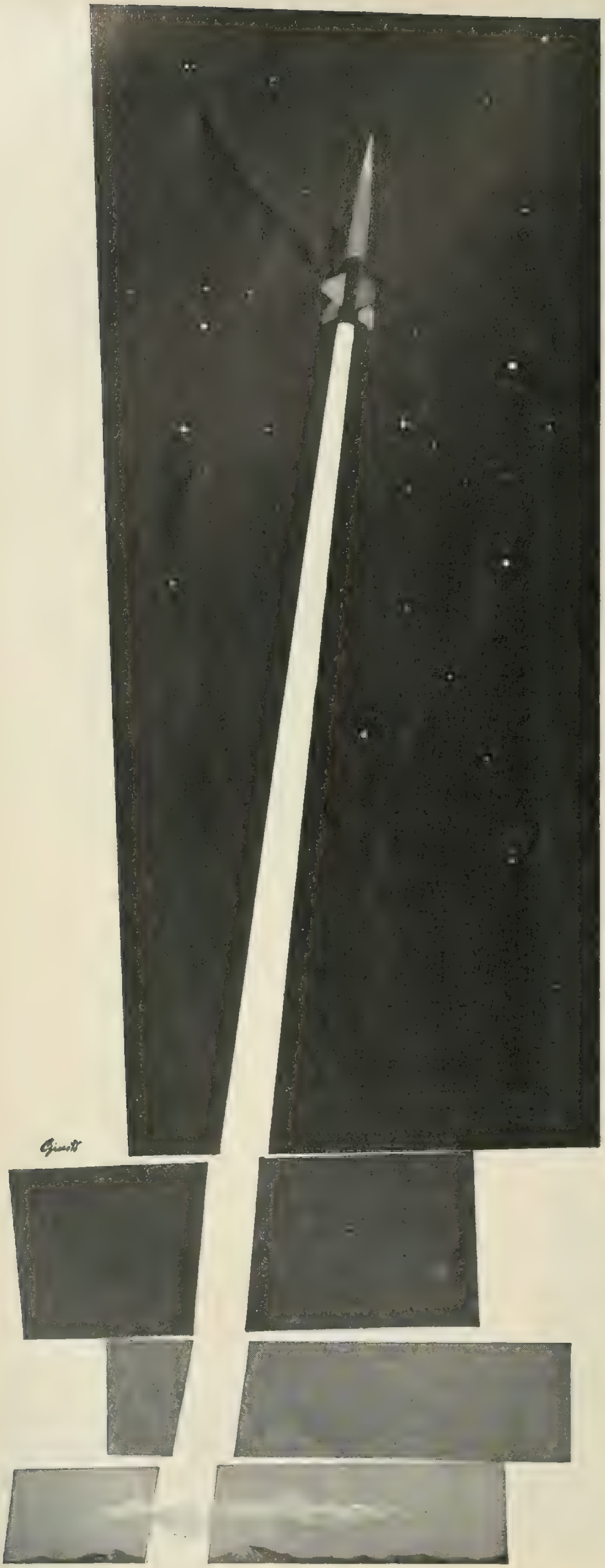

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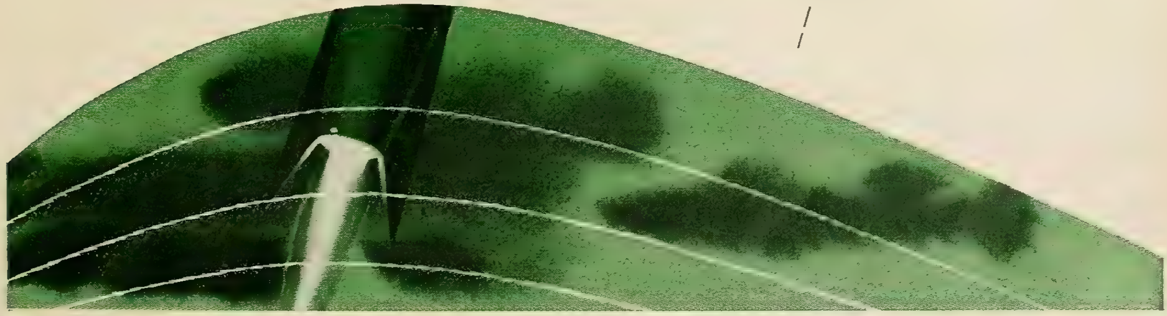

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FIREBEE: "ENEMY" JET OVER AMERICA

The most realistic "enemy" in the skies over America today is the Ryan Firebee. This jet-fast, elusive target drone is being used to sharpen the sights of the men who man the nation's air defense system and to evaluate the missiles upon which they rely.

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Developed by Ryan for the Air Force (Q-2A), Navy (KDA-1) and Army (XM21), the Firebee is in volume production and operational use. It is being fitted with special radar and infra-red reflective devices for simulating varied target characteristics and providing broader missile-target compatability. The Firebee can be equipped with wing pods to carry added fuel... a warhead... photo or television reconnaissance gear.

The Firebee is an example of Ryan's skill in blending advanced aerodynamic, jet propulsion and electronics knowledge to produce a highly successful solution to a complex aviation problem... meet a vital military need. Other examples are the Air Force-Ryan X-13 Vertijet and Navy-Ryan AN/APN-67 automatic navigator for global jet flight.

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New Version Coming Up

To the Editor:

I have noticed with interest that you have available a "Guided Missile Encyclopedia." As I am a member of the department of the U.S. Army Air Defense School which is charged with the writing of Department of the Army Field Manuals for surface-to-air missiles, it occurs to me that such an encyclopedia would be of considerable interest to us.

It would be appreciated if you would quote us the price.

In passing, I might say that your magazine, m/r, is read enthusiastically by all of my associates in the Training Literature Division.

Capt. C. N. Johns
United States Army
Air Defense School
Fort Bliss, Tex.

Reprints of the 1957 encyclopedia are available at $1.00 each. The July issue of m/r will carry an even more comprehensive missile encyclopedia.—Ed.

Enemy Dismissed?

To the Editor:

I think you will agree that the term "anti-missile missile" is a cumbersome description for an agile bird. What will we call the "anti-anti-missile missile" when it arrives?

The time has come when we should name the anti-missile missile a "dismissile" and the weapon with which we destroy it ought to be termed a "counter dismissile."

Robert Bicknell
Washington, D.C.

No Slight Intended

To the Editor:

We have, of course, more than a passing interest in the missile electronics procurement article in your February issue, authored by Selig Altschul.

But we must be frank and say that we could not understand why our division was not included in the chart on page 76, identifying companies in various phases of electronic controls or missile activities. As you probably know, Autonetics does a gross annual business approximating $100 million in the electronics and electromechanical fields.

We would therefore expect to be included in the published list on the basis of our business volume and size. Anything that you might be able to do to see that we are included in future lists would be sincerely appreciated.

Kerme Anderson
Autonetics Division,
North American Aviation, Inc.
Downey, Calif.

Chart was intended to be representative, rather than complete. Because of this, many companies with intense activity in the missile-electronic field were omitted.—Ed.

Silicone Limits

To the Editor:

We were very pleased to see the excellent coverage in the March issue of the many ways in which silicones are being utilized to produce better, more reliable rockets and missiles. However an unfortunate contradiction about the operating limits of silicone lubricating fluids appears in the lead article.

The staff report that General Electric's Versilube (R) silicone fluids are functional in the 575-700F is of course correct. In fact, hydraulic equipment designed for use with these fluids at double the 350F level mentioned by Mr. Rous is commercially available.

It is unfortunate that Mr. Baker, in his article "Silicone Applications in the Missile Industry," did not cover all of the major silicone producers in obtaining material for his survey on silicone applications in the missile field. Thus he did not mention significant General Electric contributions such as the Versilube fluids; SE-555, a silicone rubber with the physical strength formerly associated only with organic materials; the RTV (Room Temperature Vulcanizing) compounds for a variety of applications where silicone rubber could not previously be used . . .

W. E. Harris
General Electric Co.
Waterford, N.Y.

Mr. Rous' treatment of hydraulic fluids in his article "Materials Build a New Technology" was not intended as a roundup analysis of the hydrogenated aromatic mineral oil or methyl phenol silicone market. His brief mention of the current 350°F limit for silicone base fluids was a reference to the broadly accepted status of the market. We appreciate your efforts in re-emphasizing the current availability of your silicone lubricant that operates above the 350°F "limit."

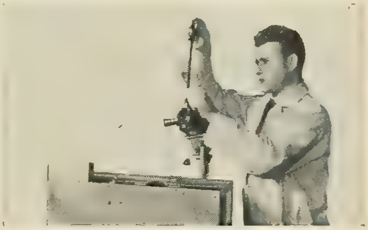
In the article "Silicone Applications in the Missile Industry" no effort was made to completely cover this vast industry. It was presented as a selective representation of one company's products and their applications.—Ed.

New 16mm. processor

DEVELOPS FILM AT SIX FEET A MINUTE

Speedy, commercial quality processing of 16 mm. film, without the use of a darkroom, is now possible with Fairchild's "Mini-Rapid 16" Processor. Here's how you can process a 100-foot roll of film, "from shooting to screening," in just 20 minutes.

1. Minutes after shooting, a 100-foot film spool is dropped into the feeding compartment. To develop, the operator simply feeds the first few inches into a slot in the compartment.



2. Less than two minutes later, the first few feet emerge, dry and ready for inspection. The operator can adjust to compensate for exposure or chemical temperature variances simply by turning the drive speed control knob.

3. After another fifteen minutes, the 100-foot roll is completely developed—another three minutes to load projector and it's ready for screening!

If you require commercial quality negative processing of 16 mm. film for immediate viewing—service never before possible—investigate Fairchild's new "Mini-Rapid 16" Processor. It's already in demand by industry and television.

For a demonstration in your own plant or office, write Fairchild Camera and Instrument Corporation, Industrial Camera Division, Dept. 9M, 5 Aerial Way, Syosset, Long Island, New York. West Coast Office: 6111 East Washington Boulevard, Los Angeles, California.

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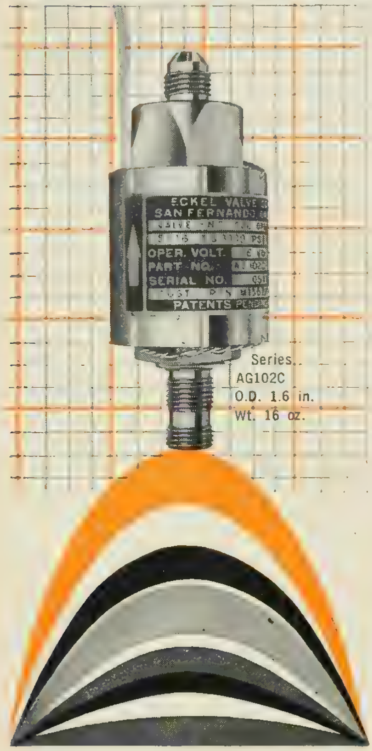

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Missile Business

by Seabrook Hull

No-profit contracts may be one result of a basic philosophical change occuring in top Pentagon circles. Conversely, other defense contracts may allow much greater profits than can now get through the Renegotiation Board. Nothing formal has yet been done in these directions. But frustration over the lack of incentive in the current methods of doing defense business, plus the lack of any means of enforcing performance on contracts is leading to an almost universal determination "to do something about it."

Of considerable cost, both in dollars and in terms of defense in being, is the fact that defense contractors have no real incentive to perform according to the original terms of the contract agreement—delivery on time at the price agreed to of hardware than can reliably do the job. Neither is there any means of policing companies that knowingly bid low on a contract on which they cannot possible perform without repetitive renegotiation of the price and terms of the contract.

Experienced Pentagon officials, at the Department of Defense and Service Secretary level, are increasingly convinced that the present system of armed forces procurement needs modifying so as to reward those who perform well and penalize those who don't. One plan now receiving wide consideration would allow greater-than-now profits to companies who performed in an outstanding manner by delivering on time, at agreed to or better-than-agreed-to prices, by making product improvements, etc. At the same time the proposed system would penalize those companies which failed to perform according to agreement by reducing or eliminating their allowed profits.

Such a system would have a number of benefits. It would encourage many efficient companies who now have no interest in defense business, because of low profit rates allowed, to compete for business. It would provide more of an incentive than conscience (as now) for performing as contracted. Finally, it would benefit the American public by getting more defense in less time for less money.

Air Force has officially blessed the group method of systems bidding. In a letter from AMC Deputy Director of Procurement and Production Major General Wm. T. Thurmond to the National Security Industrial Association, the Air Force described the "group" as a possible accepted form of contracting. The letter stated that the weapons system concept was susceptible to management proposals from systems managers and subcontractors for future design and development. It said that the subcontractors in the group should include all the systems elements, such as airframe supplier, electronics, guidance, propulsion, groundhandling (etc.) suppliers. In mind are such groups as those by Hoffman Electronics, and Stavid Engineering.

This letter may have more significance than meets the eye. Some are interpreting it as official recognition of the fact that the military cannot always just go to the traditional airframe makers for systems contracting; that syndicates may turn out to be a good alternate source—so long as they are properly organized, giving due attention to the antitrust laws, small business, responsibility for performance and knowledge of just how to file and negotiate as a group. In any case, it's a development well worth watching.

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contract report

Trends

Seven rules for getting Air Force contracts were laid out before the Texas Manufacturer's Association at a recent dinner in Houston by Assistant Air Force Secretary for Materiel Dudley C. Sharp. Here they are: (1) Get to know Air Force projects—their mission, specifications and time requirements; (2) be cost-conscious and keep overhead charges to a minimum; (3) study the engineering side of the project and figure out how to do it with a minimum of effort and overtime; (4) be prepared to fund the initial stages of the program; (5) have sufficient production talent and the most advanced tools; (6) know your production limits and bid accordingly; (7) know Air Force contracting procedures.

Secretary Sharp said: "Any contractor who consciously applies these actions can obtain defense contracts which would be profitable to himself as well as to national security." Sharp added that 8.2% of Fiscal Year 1957 prime contracts went to the smaller firms while the 21.5% of prime contracts going to large firms was eventually subcontracted to smaller firms—for a total of $1.5 billion.

In fact, a much greater share of both prime and subcontracts are of the small business variety. It's true that they may go to big companies, but they are small in dollar volume and they go to divisions of large companies which are, in effect, small firms. In other words, the volume of business available to small business is much greater than that indicated by official statistics.

New prime and subcontract leads include: Official O.K. given by Defense Department missile czar William A. Holaday to Air Force for three more IRBM/ICBM projects, including: a solid-propellant ICBM; *Polaris* as a land-based IRBM; development and production of a new oxidizer for *Titan*.

Another possible contract lead: Army is eyeing a hopped up version of the Navy's *Talos* for possible development as an anti-missile missile. Navy also is interested in further development of *Talos* as a countermeasure for ballistic missiles fired from submarines. Problems Army and/or Navy would like to see solved include: guidance for anti-missile missile role; better propellants for longer range and faster interception. Still another lead to watch: AF may buy *Regulus* II missile for surface-to-surface work.

Two bills on Capitol Hill will affect defense contracting—if they're enacted. S.3223 would extend the Defense Production Act for another two years. This is the law that gives the Office of Defense Mobilization its authority. Status: expected to be extended without question, including government guaranteed loan provision. H. R. 10830 is concerned with helping in replacement of out-of-date machine tools. Would be concerned with maintenance of modern defense production equipment in both privately owned defense contract plants and government arsenals.

Another bill, well on the way to enactment, would return government accounting to an accrued expenditure basis. It has disadvantages, but would prevent recurrence of last fall's squeeze between cash on hand and debt ceiling which resulted in untimely defense spending cutback.

Navy's in the market for developers of newer and better heat-resistant materials, particularly for atomic propulsion systems . . . Rep. F. Edward Hebert's special House Armed Services Subcommittee is starting a new investigation, particularly of Pentagon logistics and procurement policies . . . U.S. has earmarked $666 million for missiles for other nations.

Awards

Nike-Hercules: Western Electric Co., $129,592,706 for *Nike-Hercules* missile and ground equipment contracts—from Army. **Douglas Aircraft Co.,** $43.5-million for *Nike-Hercules* production and fabrication. Other contractors include **Goodyear Aircraft Co.** and **Borg-Warner,** booster hardware; **Thiokol Chemical Corp.,** sustainer motors; **Hercules Powder Co.,** booster motors; **Consolidated Western Steel Co.,** launchers.

R&D on Missiles at Jet Propulsion Laboratory: California Institute of Technology, $22.7-million from Army.

Q-2 Firebee: Ryan Aeronautical Co., $1,387,293 for production, from AMC.

Thor and Atlas: Republic Aviation Corp., $1.5-million for *Thor* and *Atlas* nose cone components, from **General Electric MOSD.**

Summary of $118 million in Army missile contracts for December 1957, shows: to **Western Electric Co.** for *Nike* family contracts of $31,058,200; $5,808,750; $3,182,903; $1,360,800; $3,718,366, $13,175,420; and $1,175,760. To **Raytheon Manufacturing Corp.** for *Hawk* contracts of $2,072,726; $8,049,500; and $8,758,697. To **Chrysler Corp.** for *Jupiter* $10,940,123; $2,356,204; and $8,729,255. To **Sperry Rand Corp.** for *Jupiter*, $1,081,377. To **Ford Instrument Co.** for *Jupiter*, $1.1-million. Plus other contracts: **Motorola,** $2,072,726; **RCA,** $4,777,000; **Douglas Aircraft,** $2,472,424; **Gilfillian,** $2,877,000; and **Martin,** $5,829,000.

Other Contracts Include:

By New York Ordnance District: Ford Instrument Co., $404,619 for designing and developing inertial devices. **Southwest Research Institute,** $32,000 for research on advance medical problems encountered in flight through the upper atmosphere space.

By Philadelphia Ordnance District: Western Electric Co., Inc., $192,993 for *Nike* spare parts & components.

By Rochester Ordnance District: A division of Pfaudler Permutit, Inc., $123,554 for tank for missile.

By Los Angeles Ordnance District: North American Aviation, Inc., $963,000 for rocket engines. **Northrop Aircraft, Inc.,** $69,000 for maintenance evaluation of DATICO equipment. **Motorola Inc., Phoenix Research Laboratories,** $150,000 for development of Airborne instrumentation. **Douglas Aircraft Co., Inc.,** $4,757,939 for launching area items. **Associated Aero Science Laboratories,** $112,000 for civilian technical assistance. **Douglas Aircraft Co. Inc.,** $131,092 for repair parts for *Nike* system. **Gilfillan Bros. Inc.,** $29,868 for repair parts for *Corporal* missile system. **Gilfillan Bros. Inc.,** $1,078,266 for engineering services related to *Corporal* missile system. **Gilfillan Bros. Inc.,** $73,828 for replenishment spare parts for *Corporal*.

Cleveland Ordnance District: North Electric Co., $131,000 and $179,382 for communications system for *Jupiter*. **Goodyear Aircraft Corp.,** $300,000 for cost contract for acquisition of additional manufacturing facilities. **Ohio State University Research Foundation,** $39,000 for research on the study of amine perchlorates as ingredients for fastburning propellants.

By AF ARDC: Armour Research Foundation of Illinois Institute of Technology, $34,870 for research on the physiological effects of ozone.

By AFMDC: University of Chicago, $53,233 for installation of an acceleration device on short track facility. **Winzen Research Inc.,** $26,000 for cost overrun. **North American Aviation Inc., Rocketdyne Div.,** $225,000 for liquid-propellant rocket sled system. **Phillips Petroleum Co.,** $135,000 for cost overrun. **Grand Central Rocket Co.,** $279,650 for rocket motors. **Thiokol Chemical Corp.,** $105,480 for rocket motors.

By HQ AMC: Hol-Gar Mfg. Corp., $428,400 for gasoline generator sets. **Marquardt Aircraft Co.,** $198,077 for services for test time at AF Marquardt Jet Laboratory. **General Electric Co.,** $140,981 for 528L targeting sub-

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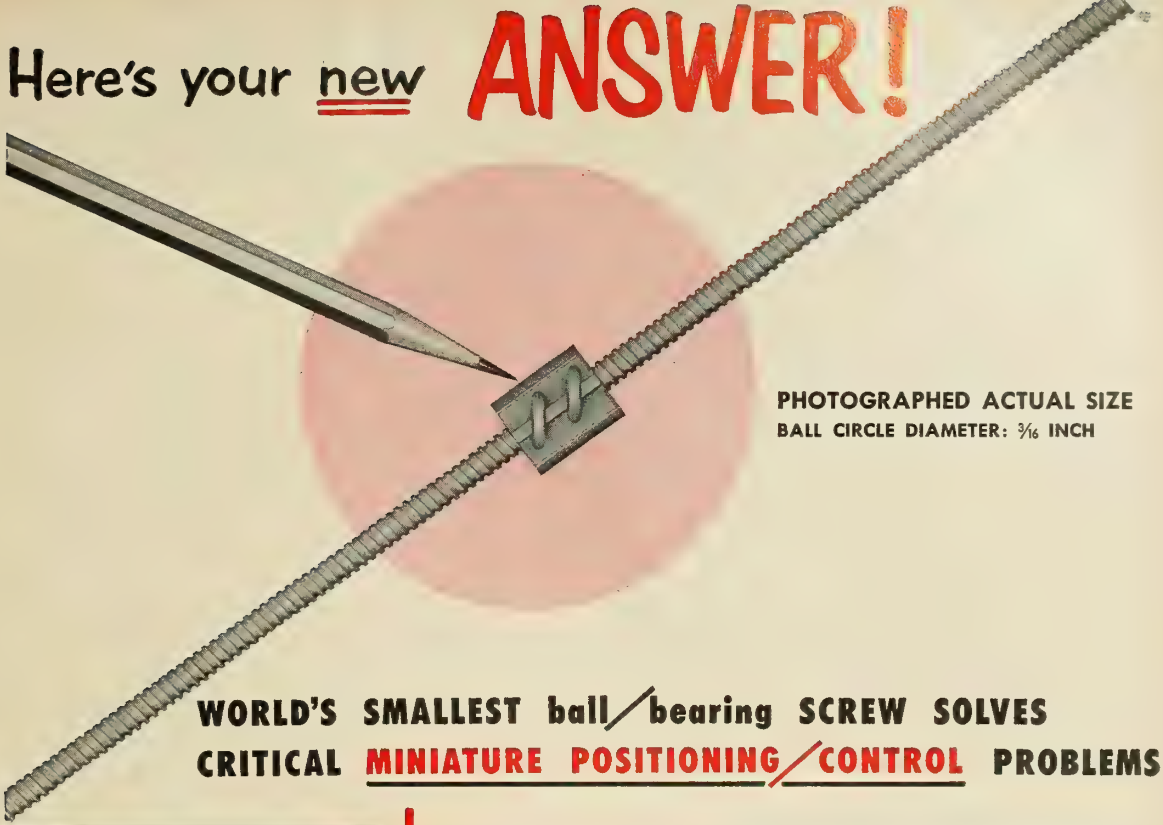

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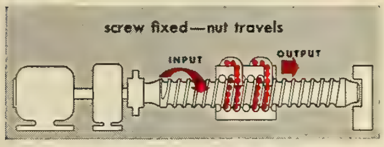

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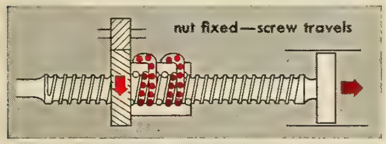

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system. **Cambridge Corp.**, $406,226 for MD-1 liquid oxygen tank semitrailer. **Radio Corp. of America, Defense Electronic Products Div.**, $322,565 for auxiliary interconnecting box for missiles.

HQ AFMTC: Wollensak Optical Co., $61,750 for sighting telescopes and accessory equipment. **Cubic Corp.**, $118,450 for increase of funds. **E. C. Morris and Son**, $29,900 for engineering services repair work on test stands and support projects WS-107A and WS-315A.

By HQ AFB: Systems Research Laboratories, $45,395 for modification of fuel test stand.

By Dayton AFD: Tru-Ohm Products Div. of Model Engineering & Mfg. Co. Inc., $26,227 for resistors. **Electronic Div., Westinghouse Electric Corp.**, $116,308 for Westinghouse microwave system map. **John Oster Mfg. Co.**, $25,875 for Oster type motor. **The Hass Instrument Corp.**, $65,520 for estimates for altitude test range. **Aerotec Corp.**, $39,809 for various pressure switches. **General Electric Co.**, $42,435 for transformer. **Sylvania Electric Products Inc.**, $42,120 for tube-electron. **Penta Laboratories, Inc.**, $79,200 for tube-electron. **Receiving & Cathode Ray Tube Operations, Raytheon Mfg. Co.**, $68,200 for tube-electron. **Minneapolis-Honeywell Regulator Co.**, $47,158 for pressure switch. **Van Wagner Co.**, $47,500 for inspections sets. **National Electronics, Inc.**, $58,370 for tube-electron. **General Electric Co.**, $192,183 for tube-electron. **Kuthe Laboratories, Inc.**, $340,972 for tube-electron.

By AFOSR: The Pennsylvania State University, $55,912 for research on crystalline solids. **Polytechnic Institute of Brooklyn**, $50,000 for research on analytical study of high-frequency oscillatory combustion and of scaling up of rockets. **Aerochem Research Laboratories, Inc.**, $54,015 for research on low-temperature plasma jet. **General Atomic Div.**, $57,753 for research on free-radical solids using beam techniques. **Polytechnic Institute of Brooklyn**, $40,000 for research on investigation of plates and shells under elevated temperatures. **University of Miami**, $31,173 for research on nuclear emulsion studies. **The Board of Trustees of the University of Illinois**, $30,300 for study of surface physics. **New York University**, $50,000 for research on elasticity. **General Electric Co.**, $653,317 for studies in heat transfer. **The Institute for Advanced Study**, $40,500 for studies in mathematical analysis.

By Army Signal Supply Agency: Aeronautronic Systems, Inc., $182,355 for research to conduct a study in the guided missile range instrumentation field, modification. **Haller, Raymond and Brown, Inc.**, $46,748 for directory for army electronic and deception equipment. **Trustees of Princeton Univ.**, $66,000 for investigation of high polymers. **Engleman & Co.**, $32,940 for investigation of the vulnerability of electronic equipment. **Stanford Research Institute**, $88,380 for investigation design for ground based antennas. **Tung-Sol Electric, Inc.**, $49,500 for research on utilization of magnesium-oxide electron emission. **Pacific Division, Bendix Aviation Corp.**, $36,135 for investigating the problems in high speed data transmission systems. **Hewlett-Packard Co.**, $60,600 for digital delay generator.

By Redstone Arsenal: Becco Chemical Div., Food Machinery & Chemical Corp., $88,140 for hydrogen peroxide. **Kaiser Aluminum & Chemical Sales, Inc.**, $45,700 for cable reels. **Permanent Filter Corp.**, for liquid oxygen filter. **Allan Aircraft Co.**, $25,196 for AN fasteners. **Collins Engineering Corp.**, $73,132 for AN fittings. **Electronic Associates, Inc.**, $32,025 for electronic equipment. **Thiokol Chemical Corp.**, $194,996 for continuation of research and development of large size rocket engine cases. **Thiokol Chemical Corp.**, $74,944 for engineering evaluation of improved two-level thrust system. **Linde Co.**, $96,360 for liquid oxygen and liquid nitrogen.

By Army, Corps of Engineers: MacGuire-Glaser Co., $168,418 for Army launching area No. 2, Phase II. **R. E. Clarson, Inc.**, $130,388 for telemetry lessee for launch complexes 11, 12, 14, 15, 16, and 19, and CZR camera pads for complex 19, AFMTC, Patrick AFB. **B. B. McCormick & Sons, Inc.**, $251,463 for construction of stone revetment, Canaveral Harbor, AFMTC. **Diversified Builders, Inc.**, $162,786 for construction of Calibration laboratory. **Fairbanks, Morse & Co.**, $119,931 for generator unit and emergency generator set. **Satchwell Electric Construction Co. Inc.**, $402,513 for propellant analysis lab, AFMTC, Patrick AFB. **R. E. Clarson Inc.**, $488,415 for electric power plant, Cape Canaveral Missile Annex, Patrick AFB.

By Army, Engineer Division: Clarkeson Engineering Co. Inc., $53,500 for items for *Nike* sites. **Crandall Engineering Co.**, for items for *Nike* sites. **A. T. Scanzillo Co.**, $93,291 for construction of additional building *Nike* Battery No. 17.

By Army, Engineer District: George A. Rutherford, Inc., $560,451 for engineering analysis. **C. H. Leavell & Co.**, $830,934 for missile assembly bldg., phase II.

By Purchasing and Contracting Office of Army: Harvey Machine Co., Inc., $102,295 for explosive foxhole diggers.

By Ordnance District, Army: Flexonics Corp., $79,287 for supply contract.

By Army, Mobile, Corps of Engineers: The Rust Engineering Co., $43,000 for architect-engineer services in connection with ABMA facilities FY 1958 at Redstone Arsenal. **Daniel Construction Co.**, $441,115 for construction of photographic & video instrumentation laboratory at Redstone Arsenal.

By Navy, Bureau of Ordnance: Aerojet-General Corp., $2,275,470 for solid propellant JATO, rocket.

By Navy, Sixth Naval District; Public Works Officer: Nat G. Harrison Overseas Corp., $362,500 for additional instrumentation for the AFMTC.

By Navy, Bureau of Aeronautics, Purchasing Office Dept.: Stanford Research Institute, $99,812 for investigating the application of steel honeycomb and other sandwich core materials. **Trionics Corp.**, $29,607 for research on heat-resistant elastomerics.

By Navy, Bureau of Ships: Stavid Engineering Inc., $56,194 for services of electronics field engineers.

By Navy, Purchasing Office: Arma Div., American Bosch Arma Corp., $52,800 for engineering services. **International Business Machine Corp.**, $42,000 for mylar magnetic tape. **United Aircraft Corp., Hamilton Standard Div.**, $103,224 for turbine starter. **Lukens Steel Co.**, $278,584 for steel plates. **Gilbert Dannehower, i/t/a High Precision Prod. Co.**, $55,663 for gear grinding machine.

By Naval Research Laboratory: Burroughs Corp., Electro Data Div., $42,355 for electro-data computer.

By Navy Dept.: McConathy, Hoffman & Associates, Inc., $71,885 for Burner Laboratory bldg.

By Navy, Office of Naval Research: Radio Corp. of America, $55,339 for development of high-power transistors. **University of Illinois**, $33,417 for research of extra-terrestrial radio sources.

By Naval Training Device Center: Sylvania Electric Products, Inc., $54,989 for automatic target tracking and intelligence data display device.

By Atomic Energy Commission: J. A. Tiberti Construction Comp., $815,572 for control building area. **Sierra Construction Comp., Inc.**, $2,058,355 for assembly-disassembly building. **Pittsburgh-Des Moines Steel Co.**, $107,360 for water storage tanks. **Petroleum Combustion and Engineering Co.**, $1,209,000 for test cell and tank farm.

Fred Galant and L. B. Wells of Visalia, $890,346 for access road. **Perry Brothers Drilling Co. of Flagstaff**, $89,325 for water supply wells. **J. L. Croft and Sons, Inc.**, $472,307 for roads. **Hansen Plumbing and Heating Co.**, $147,037 for water distribution system. **A. D. Schader Co.**, $252,036.09 for railroad facilities.

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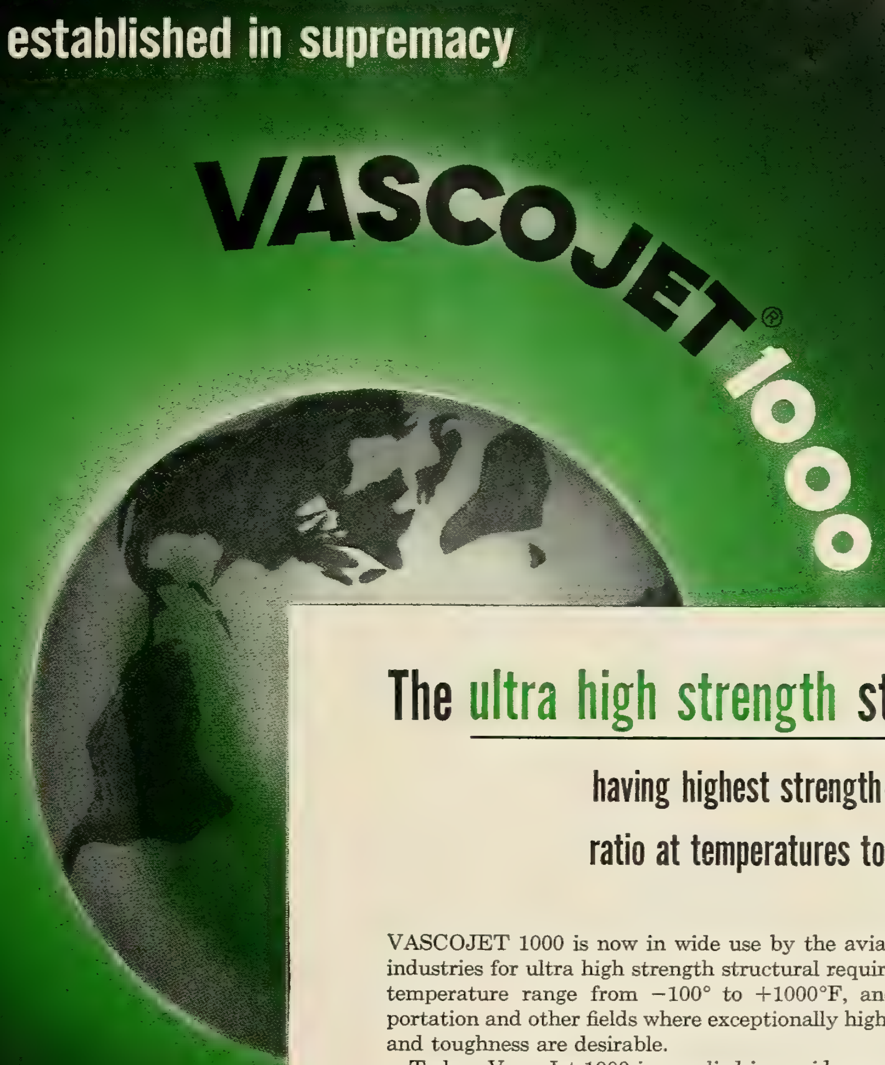

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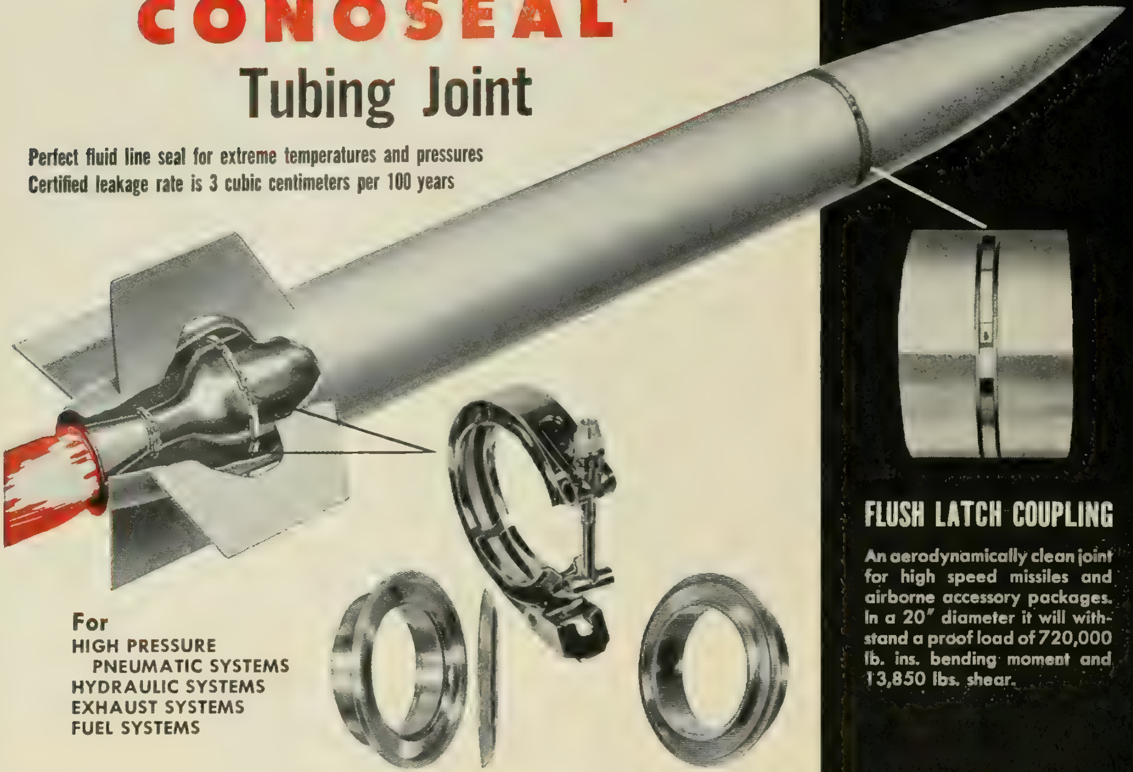

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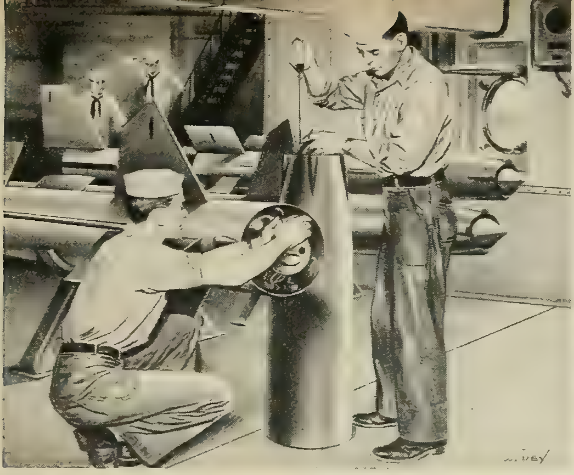

MISSILE COMPONENTS Bulova safety and arming systems protect ground, air and sea crews from load to launch, then take over in flight. Safety factor of one in a million is specified and reliably delivered by Bulova's precision production facilities. Powder-driven gyros and fuzing systems are among other Bulova developments for 18 key missiles.

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INFRA-RED COMPONENTS Bulova infra-red cells are designed to unerringly guide Sidewinders to target. Bulova-improved production processes increase yield and product reliability. Other infra-red developments include filters, reticles and thermistor bolometers, as well as advanced research in mosaic and lead selenide cells.

PHOTOGRAPHIC SYSTEMS Bulova's new high performance 70mm recon-camera features 8 frame/sec. and pulse operation . . . vibration-free exposures to 1/4000 sec. From the smallest 16mm gun camera ever built to units of 9x18" format size, Bulova developments include optical, data recording and instrumentation, and special sequence cameras.

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APRIL

Eighth International Symposium, Electronic Wave Guides, sponsored by Microwave Research Institute of Brooklyn Polytechnic Institute, Engineering Societies Building, New York, N.Y., April 8-10.

ASME Maintenance and Plant Engineering Conference, Penn-Sheraton Hotel, Pittsburgh, Pa., April 14-15.

ASME Design Engineering Conference, International Amphitheater, Chicago, Ill., April 14-17.

ASME and AWS Engineering Division Joint Conference, Statler Hotel, St. Louis, Mo., April 15-17.

Institute of Environmental Engineers, Second Annual Technical Meeting, Hotel New Yorker, New York, N.Y., April 17-20.

AIEE, IRE, EIA, WCEMA Electronic Components Conference, Reliable Application of Component Parts, Ambassador Hotel, Los Angeles, Calif., April 22-24.

Second Annual Astronautics Conference, sponsored by Air Force Office of Scientific Research and Institute of Aeronautical Sciences, Shirley Savoy Hotel, Denver, Colo., April 28-30.

MAY

American Society of Tool Engineers, Second Annual Technical Meeting, New York, N.Y., May 1-8.

National Flight Test Instrumentation Symposium, Instrument Society of America, Park Sheraton Hotel, New York, N.Y., May 4-7.

Professional Group on Microwave Theory and Techniques, National Symposium, Stanford University, Palo Alto, Calif., May 5-7.

IRE, ACM, AIEE, Western Joint Computer Conference, Los Angeles, Calif., May 6-9.

Armed Forces Day "Open House" at most U.S. Military Bases. Observances in various cities May 10-18.

IRE, National Conference on Aeronautical Electronics, Biltmore Hotel, Dayton, Ohio, May 12-14.

JUNE

IAS, AIEE, ISA, National Telemetering Conference, Lord Baltimore Hotel, Baltimore, Md., June 2-4.

First National Guided Missile Industry Conference, Mayflower Hotel, Washington, D.C., June 4-6 (Robert H. Goddard Memorial Dinner June 6).

IRE Second National Symposium on Production Techniques, Hotel New Yorker, N.Y., N.Y., June 5-6.

American Rocket Society, Semiannual Meeting, Hotel Statler, Los Angeles, Calif., June 8-11.

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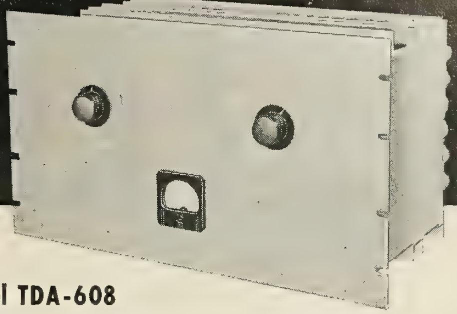

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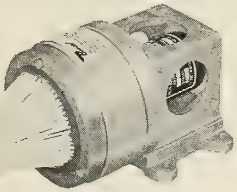

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THE PRODUCTS OF THE MIND

The world we live in is in large part the product of the scientific thought and accomplishment of the past, translated into engineering achievements. Whether we continue to go forward depends on whether the scientific curiosity, the imagination, the careful thought, and the logical analysis of the past, upon which today's technical achievements were built, can exist and flourish in the environment of the new world.

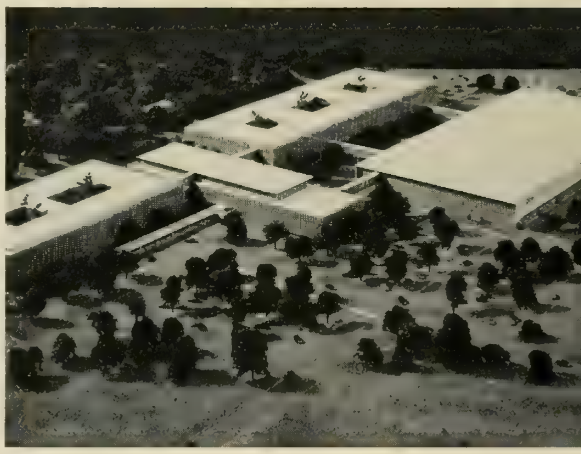
At Avco Research and Advanced Development Division, and at other places in the free world, an atmosphere exists in which the inquiring mind may live and create. We have the technical assistance and the facilities by which ideas are converted into concrete accomplishments. Many things have been done, and infinitely more remain to be done—the world of scientific thought is unlimited and promising. From the products of the mind will come the technical world of tomorrow.

Sidney L. Simon

Dr. Sidney L. Simon
Assistant to the President

Avco
Research & Advanced Development

Dr. Sidney L. Simon



Pictured above is our new Research and Development Center now under construction in Wilmington, Massachusetts. Scheduled for completion this year, the ultramodern laboratory will house the scientific and technical staff of the Avco Research and Advanced Development Division.

Avco Research and Advanced Development Division now offers unusual and exciting career opportunities for exceptionally qualified and forward-looking scientists and engineers.

Write to Dr. R. W. Johnston, Scientific and Technical Relations,
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Our Armed Services' urgent need for high-speed recordings prompted Burroughs Corporation—whose commercial business necessitates many types of printing devices—to develop these tools. Fact is, Burroughs Corporation has successfully undertaken many other military projects, too—often seeing them through from initial research to final installation and field service. We welcome additional projects in all areas of our proved ability, including all phases of control systems and data processing involving electronic computation.

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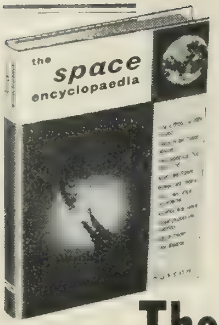

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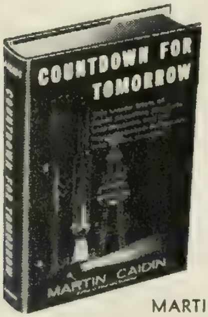

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DUTTON

Propulsion Engineering

by Alfred J. Zaehringer

Look for new propellant materials. China Lake NOTS reports work on lithium hydroperoxide 1-hydrate. Other new propellant compounds coming out of the lab are lithium peroxide, boron-amines, alkyl borons, cyanogen, urazole and the organosilanes. Olin Mathieson is now producing commercial quantities of anhydrous hydrazine and also the aqueous grades; also being produced is the new hydroxyethylhydrazine (HEH) which is a good fuel and is hypergolic with certain oxidants. Pennsalt is introducing two new oxidants which may have considerable promise in solids: 3-nitroperchloryl-benzene and pehchloramide.

Lower-cost exotic fuels may be shaping up. Bellvue Laboratories of New York chlorinates cheap borax to make intermediate boron trichloride some 50% cheaper than existing high-temperature methods. It now takes about 10 pounds of the trichloride to make one pound of pentaborane or decaborane.

Propellant thermochemists will be interested in a program completed by AEC's Argonne National Laboratory. The thermodynamic behavior of many oxides, fluorides and chlorides has been determined to 2500°K and the data will be useful in determining the characteristics of rocket exhaust products and in finding pyrometallurgical methods for the separation of fission products from spent metallic nuclear fuels.

The Soviets have high-performance solid propellants. The last-stage rocket (used on both *Sputnik* I and II) used a large composite grain that delivered 0.75-1.0 million lb-sec. The sea-level specific impulse is estimated at about 273 sec. The average high-energy solid propellant now in use in the United States puts out about 225 sec at sea level.

More ammonium perchlorate for solid propellants is on the way. Pennsalt will produce the oxidant on the West Coast and at a site to be announced in the South. The process will be based on sodium chlorate as the raw material. Up to the present time, American Potash & Chemical at Henderson, Nev., was the sole U.S. large-scale producer. Now, with a blossoming of large solid rockets, more of this vital composite ingredient will have to be produced.

Nuclear rocket engine development will get a boost when Rocketdyne and the Air Force team up with AEC. The California firm has received a research and study contract with WADC on the atomic rocket. Present NAA atomic rocket view is quite conventional—an atomic pile which heats up an inert working fluid and exhausts it through a conventional nozzle.

Nuclear fuel elements for atomic rockets may be quite expensive. Based on present cost of \$15-\$30/gram for 90% enriched material (U^{235} or Pu^{239}), the fuel for a typical engine might cost over several hundred thousand dollars.

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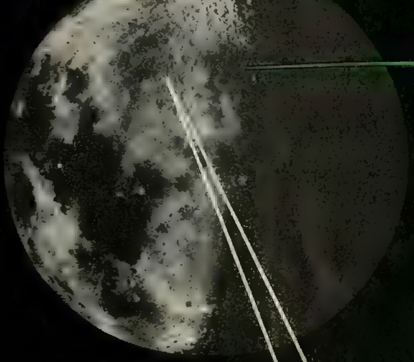

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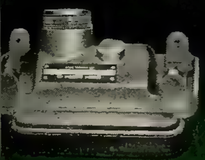

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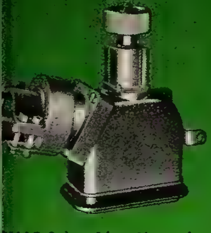

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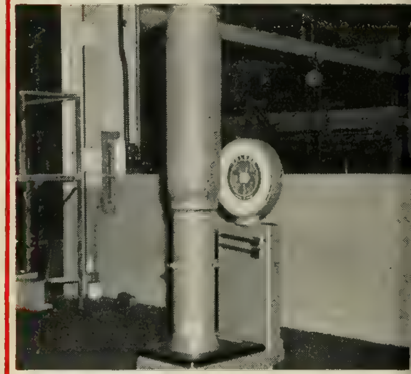
Forward end view of engine showing igniter assembly in place.



Completely balanced engine assembly is given final check for compliance to weight.

Zoom... PARISH puts the power behind this missile!

Parish-built rocket engine fires U.S. Army's LaCrosse missile.

The U. S. Army's Lacrosse missile takes to the air. This surface-to-surface guided missile is a rugged, close and general support all-weather weapon of high accuracy with a single shot kill power. *Parish* is producing the engine. Martin-Orlando makes the missile.

The engine and its numerous components require the utmost in precision engineering, fabrication and assembly. Balancing and weight are critical. For instance, the weight of the entire unit must be within ± ¼ of 1% of the total. Production fixtures and jigs had to be engineered for duplicate accuracy because any engine must fit any missile.

Parish Pressed Steel is the first company to successfully mass produce these solid-propellant engines. The reason: *Parish* has the unique combination of engineering experience, production know-how and precision equipment needed for such critical ordnance work. They're available for additional work right now. Call or write for additional information . . . today.

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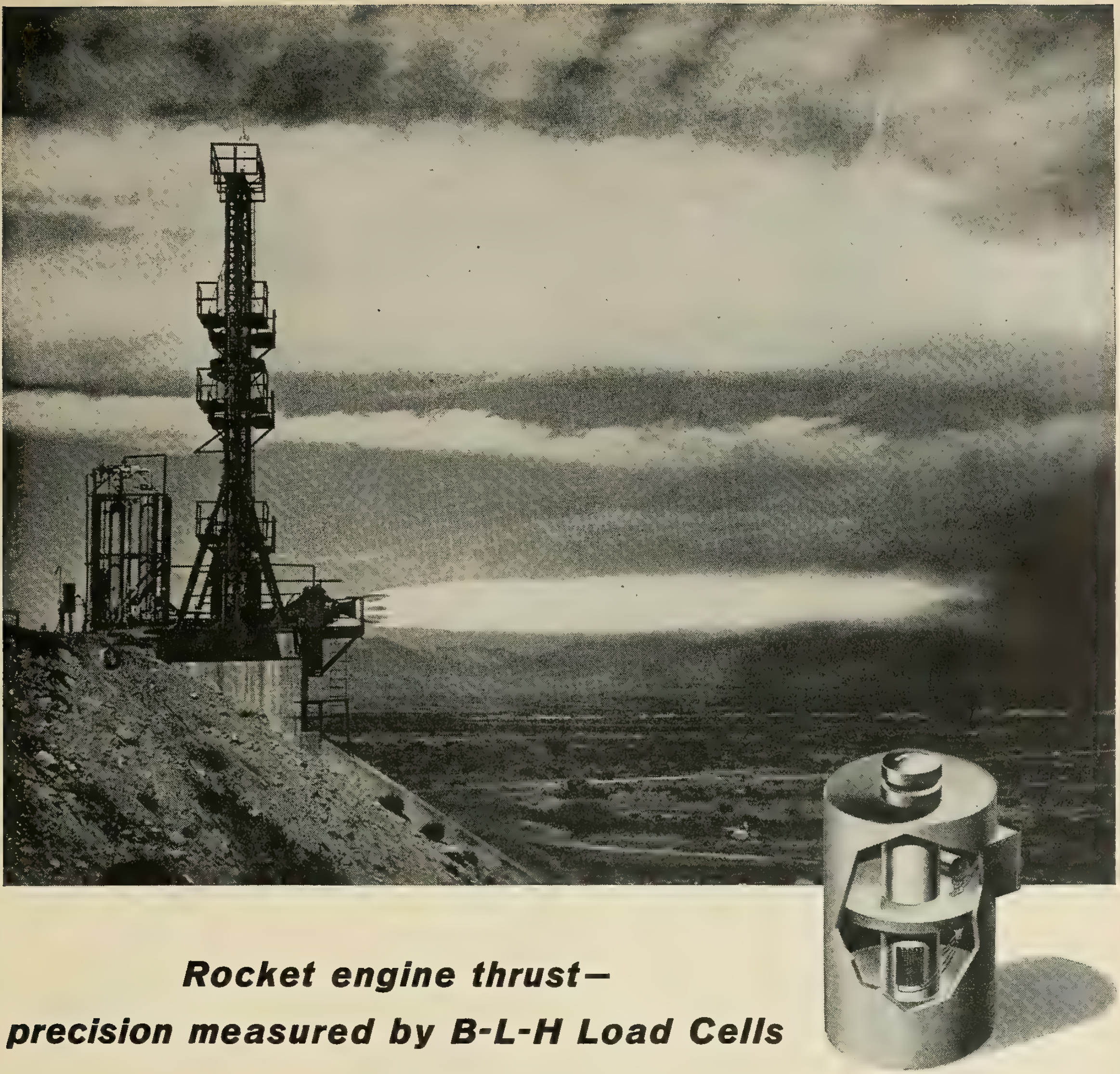

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A report to Engineers and Scientists from Lockheed

...WHERE EXPANDING MISSILE PROGRAMS INSURE MORE

NEW SHOCK TUBE TESTS MISSILE DESIGNS FOR POLARIS

This huge new shock tube, performing basic research and providing ballistic missile design data at speeds up to 20,000 feet per second, is now in operation at the Division's research and development laboratories.

The 44-foot long tube is used for advanced design work on the Polaris, a solid propellant weapon to be launched from submarines.

Temperatures and pressures generated within the tube will simulate those encountered by a long-range ballistic missile as it plunges from space into the earth's dense blanket of air. Shown preparing a test in the shock tube are Dr. Daniel Bershader, center, Manager of Gas Dynamics Dept., with scientists Jerry D. Kennedy, left, and Wayland Marlow III.

Missile Systems

PROMISING CAREERS

Lockheed Missile Systems is in the forefront of U.S. missile developers. For example, projects like the Polaris strategic ballistic missile are proof of Lockheed's leadership in solid fuel weapons systems.

Work on Polaris—and a giant earth satellite under development by Lockheed since 1955—has led Division scientists and engineers into the most sophisticated areas of research and development. Highly advanced facilities in our multi-million dollar laboratories, near Stanford University, provide the ideal technical environment.

As more emphasis is placed on missile's role in U.S. defense, activities within our missile programs—like those pictured here—will inevitably grow. This means better opportunities for you to move rapidly ahead in your career.

Positions are open on all levels in: **Aerodynamics, Thermodynamics, Guidance, Propulsion, Flight Controls, Inertial Guidance, Electronics, Ground Support, Information Processing, Structures, Human Engineering, Systems Integration, and Materials Research.** Qualified engineers and scientists are invited to direct inquires to M. W. Peterson, Research and Development Staff, Sunnyvale 7, California.

Lockheed **MISSILE SYSTEMS** A DIVISION OF LOCKHEED AIRCRAFT CORPORATION

PALO ALTO • SUNNYVALE • VAN NUYS • SANTA CRUZ • CALIFORNIA

HOW LOCKHEED HUMAN ENGINEERS HELP MISSILES FLY BETTER

Polaris and other major Lockheed missile systems "fly" better through efforts of Division human engineers like Dr. Joseph W. Wissel, left, and Dr. John E. Mangelsdorf, right. They are shown with Flight Control Analysis engineer Roy J. Niewald, collecting flight control accuracy data on a display parameter.

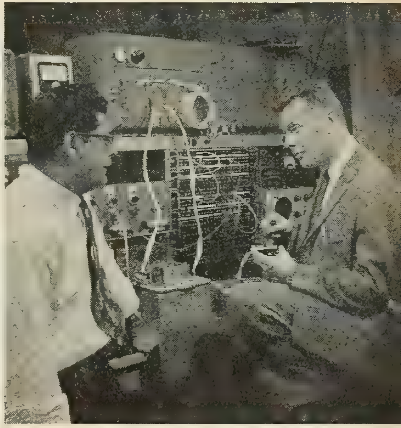
Studies of man-machine systems like the missile control station enable engineering-psychologists to develop advanced equipment which minimizes the opportunity for human error.

Missile flight control is one of the challenging problems which human engineers—working with other Lockheed scientists and engineers—solve in this era of complex missile systems.

PAIR OF UNIVACS SOLVE TOUGH DESIGN PROBLEMS

Two Univac Scientifics today aid preliminary design work for Lockheed missiles by solving tough flight simulation problems at Division laboratories, Palo Alto. These high speed digital computers aid in the study of missile characteristics, performing scientific and engineering calculations and data reduction by means of the most advanced techniques.

Above, Dr. J. P. Nash, left, and R. V. Middleton review instructions at a Univac control console before starting problem. The $1½ million computers are part of an installation which is one of the largest and most complete in the West.



LMS ENGINEERS DEVELOPING TRANSISTOR FLIGHT CONTROLS

Transistorized flight control systems for the Polaris ballistic missile program are being tested and developed under the direction of Gene Schott, Flight Controls Department Manager, right. Schott is shown discussing results of a recent test with design engineer Carlos Avila.

Transistorization of missile control systems is receiving top attention from Lockheed Missile Systems engineers and scientists in the interest of saving weight and space over present flight control systems. This work is being conducted in the Division's Palo Alto and Sunnyvale laboratories.

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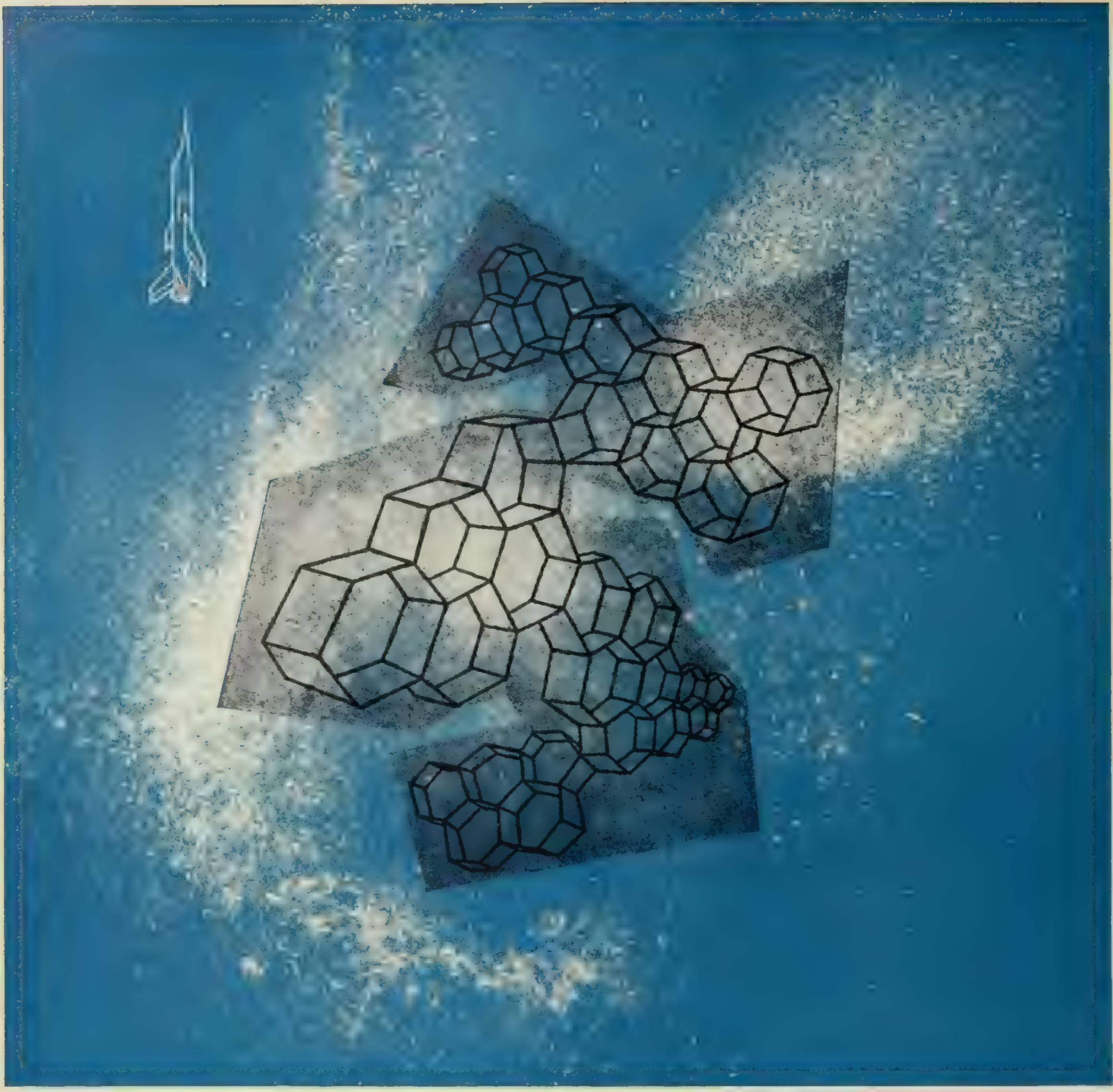

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VOL. 3 NO. 4

APRIL, 1958

missiles and rockets

MAGAZINE OF WORLD ASTRONAUTICS

Old German Concept Becomes Reality:

Navy Pushing New *Subroc* Missile

Termed "ultimate" weapon by officials

By Erik Bergaust

Reliable sources have confirmed that the Navy is conducting a bidding competition for a new weapon to be called *Subroc*, or submarine-launched rocket. First use of the weapon would be for antisubmarine warfare but it could also be employed against other targets.

Faced with the prospect of not having operational *Polaris*-launching subs much before 1961 or 1962, the Navy will use the *Subroc* as its major submarine-type weapon at least until then. Washington officials have already dubbed the *Subroc*, "the interim ultimate weapon."

The Navy reportedly invited bids from 64 companies and received proposals from 29. Of the 29, about half will be asked to resubmit proposals in more detail and with dollar signs attached. This last action is scheduled to take place sometime between the middle of April and the 1st of May. Contracts will be let then and development will get underway.

Subroc based on an old German concept, is initially designed to be an underwater-to-air-to-underwater antisubmarine weapon. Reportedly Navy has set aside more money for this weapons system than any other except *Polaris*. Advantage of the weapon is that it is designed to be launched through conventional 21-inch torpedo tubes. Future plans for *Subroc* include its use as a tactical underwater-to-air-to-surface ballistic missile, and as an underwater-to-air antiaircraft and anti-missile weapon. Initial development, however, will be on the antisubmarine weapon.

Subroc will probably be somewhat similar to *RAT* in basic concept—a rocket booster for a sonar homing torpedo. Opportunities for business for missile metal machining firms will be considerable. *Subroc* will have at least four separate powerplants:

It will have a small motor to get it near or to the water surface, it could be a rocket—or turbine-powered propeller. At surface, main booster stage will fire. This will be conventional solid-propellant motor. *Subroc* will also carry a system of small retro rockets to help fix its ballistic trajectory. These will probably be liquid (hydrogen peroxide-potassium permanganate). Big solid-propellant motors will contain jetavators for guidance. Final propulsion system will be another underwater unit—either a conventional torpedo engine or a hydroduct (underwater ramjet) or a rocket motor.

The most striking feature of the *Subroc* is that it is to be designed for launching through conventional torpedo tubes, eliminating the problem of separately designed launchers as in the *Polaris* program. Most existing subs could be used immediately, including the three nuclear subs now afloat. Future *Albacore*-type subs would need no modification to carry *Subroc*.

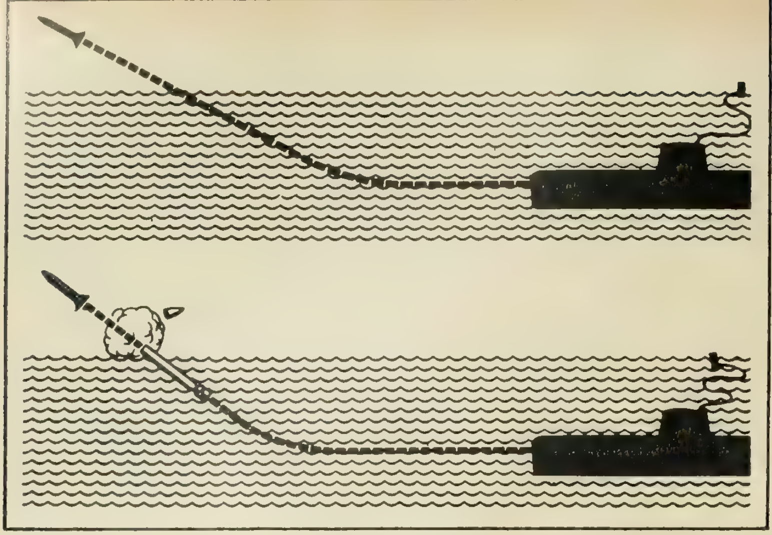
The *Subroc* is described as a torpedo-type weapon capable of being launched from a 21-inch torpedo tube. It is fired under water but takes to the air, using inertial guidance in flight, with an acoustic homing system cutting in when it re-enters the water. Targets would be programmed into self-contained guidance computers and would presumably be easy to insert or change if required.

The weapon will use a solid-propellant rocket for propulsion with jetavators for control and retro rockets for proper power adjustments to achieve a ballistic course. The warhead is said to be nuclear or thermonuclear, giving the acoustic homing and inertial guidance and control systems much greater leeway in finding the target because of the

Reds To Fly Atomic Airplane Soon

CHICAGO—Soviet nuclear rocket research is progressing "nicely" and their atomic-powered airplane will be flying "soon," according to Soviet scientists who visited the Nuclear Congress and the Atomic Exposition in Chicago last month. Nuclear rocket propulsion has been discussed openly in recent years by Soviet scientists. A meeting delegate said a Russian scientist had told him "we're probably ahead of the Americans in this field."

Several technical papers on nuclear propulsion for aircraft were presented at the Nuclear Congress. Simultaneously—at the semiannual meeting of the American Rocket Society in Dallas—four papers on nuclear rocket propulsion were given. ARS members expressed their hope that this country get a nuclear rocket program under way instead of the "nibbling" currently taking place. There was considerable criticism of how the military and the AEC had contributed to the delay of such programs.



SUBROC-TYPE missiles as conceived by the Germans in 1944.

hugely expanded kill radius possible.

With the current threat posed by Russia in the submarine warfare area, the Navy looks to the *Subroc* as a powerful deterrent. Russia now has somewhere in the vicinity of 500 submarines compared to our 100-odd active and 50 odd in mothballs so a weapon such as *Subroc* can act as quite an equalizer. In combination with airborne spotters, its range is probably something like 200 miles. This minimizes a trouble common to antisubmarine warfare—mistaking your own subs for those of the enemy.

Submarine warfare is complex and has many phases but the significant point about the *Subroc* is that it can be fitted into the existing structure without any modification to existing equipment. It can be carried by present-day subs, it can utilize nuclear warheads developed for other missiles, it can use existing elements of antisubmarine warfare such as blimps, patrol planes and sonar buoys, and it can draw on the missile industry for its component parts such as the rocket engine, the inertial guidance and the sonar guidance.

Antisubmarine warfare is the first use of the *Subroc*, but Navy planners see much more in the future. One suggested application would be a fleet of submarines launching *Subroc*s to clear an area in enemy territory for invasion, leaving a "clean" corridor for our forces. Another is for submarine-to-air using infrared homing.

Subroc is another indication of the Navy's real determination to stay in the missile business. The *Polaris* program has already sounded the death knell for land-based IRBMs and rumor has it that the Navy is thinking of a doubled-range *Polaris* which could revolutionize ICBM warfare. Now, with tactical uses such as pre-invasion softening and anti-aircraft, the *Subroc*, because it does not require any new supporting equipment, might well secure another chunk of the nation's defense complex for the Navy.

Couple *Subroc* with conventional torpedoes, rocket-assisted torpedoes, the *Polaris*, and an extended-range *Polaris*, and you have a missile system which can do just about everything in point-to-point tactical warfare. Navy officials have indicated they are pushing a plan to station a number of *Subroc*-type subs under the polar ice pack for instant retaliation. Experts seem to think it would be impossible for an enemy to spot these subs.

Army Secretary Witnesses Third *Explorer* III Launch

With Secretary of the Army Brucker and leaders of the Army missile team for an audience, *Explorer* III roared into space at 12:38 p.m., March 26 to join America's other two satellites in orbit.

Some 83,000 pounds of thrust provided by the *Jupiter* C first-stage's new high energy fuel, hydyne, lifted the four-stage vehicle off the launching pad at Cape Canaveral. The second, third and fourth stages which carried the satellite into orbit was made up of a veritable company of scaled-down *Sergeant* rockets.

The 80-inch long, pencil-shaped satellite weighing 31 pounds was packed with equipment to measure and transmit data on cosmic rays, micrometeorite activity, and temperatures. In addition, *Explorer* III carried a small tape recorder which could store information during flight and transmit it to a ground station on command. (See *Explorer* data story, page 47).

Extension o

by Frank McGuire

The Navy has a crash program in the works to foil the effectiveness of the Soviet undersea fleet. Known as the HERALD system, this is a massive, passive sonar installation; a harbor electronic ranging and listening device. Originally intended to protect harbors from undetected enemy submarines sneaking into a strategic port, the HERALD system is now being extended and improved to protect long stretches of strategic coastline against missile-launching submarines. (m/r, May, 1957).

Existence of the HERALD system was admitted, apparently accidentally, in a basic handbook for Naval officers. The handbook, on sale to the public through the Government Printing Office, indicates that the HERALD has been under development, and perhaps even in use, since World War II.

The Navy is pushing antisubmarine warfare to the utmost and beginning to release small amounts of information on the results of its developmental efforts in this field.

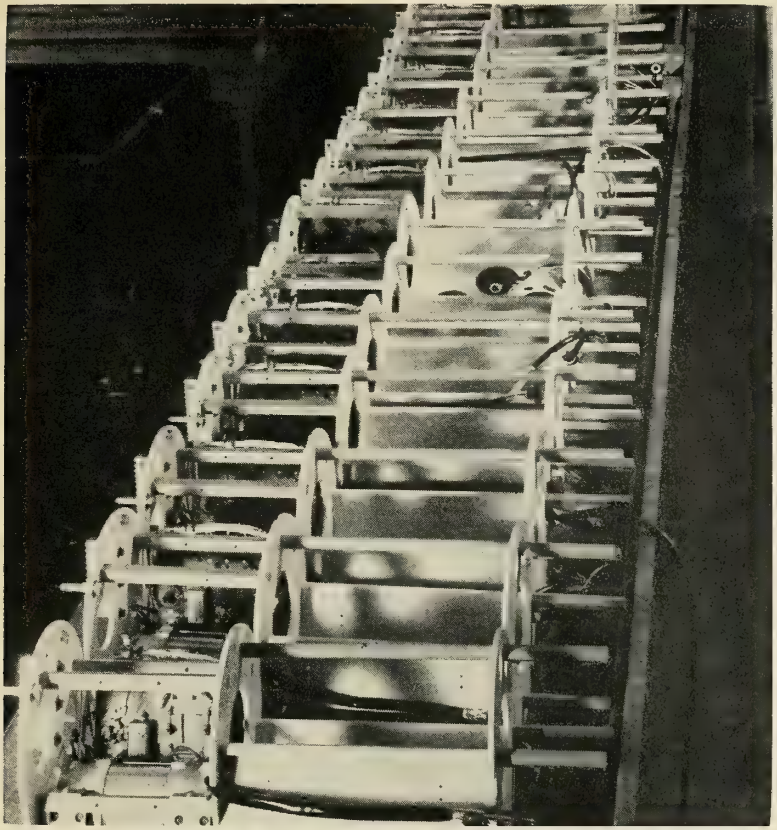
But the motto "silent service," is being carried through all phases of the submarine and antisubmarine program and is responsible for the tightest security measures in the U.S. defense setup.

It has become more difficult to obtain information regarding an obsolete torpedo than to get data on our latest bombers and missiles. The existence of the MK 32 torpedo, for example, was finally acknowledged to the press on January 15, only one day before the Navy announced that is was obsolete. Production of the MK 32 ceased in 1955.

Despite security precautions, however, the Navy is known to be working on several types of antisubmarine warfare (ASW) devices. The same heavily shrouded torpedoes loaded aboard submarines are openly mounted on destroyers tied up in domestic and foreign ports. The MK 43 *RAT* combination is a case in point since it is mounted on a standard 5-inch gun turret aboard Navy destroyers.

The MK 43 is expected to be followed by a more advanced version said to incorporate greater range, speed, accuracy and operating depth. This new weapon, probably to be called the MK 44 antisubmarine torpedo, is obviously under development by General Electric and under a pending $3.4 million contract, for more than 100 units which may go into prototype and pilot

HERALD Systems Planned



PARTIAL AFTERBODIES of the MK 43 torpedo rest on the line at the Naval Ordnance Plant in Forest Park, Ill. awaiting completion. The Mk 43, a rocket-assisted antisubmarine torpedo, is being replaced by the General Electric Mk 44 torpedo.

production at the Forest Park, Ill., Naval Ordnance plant sometime this summer. A great deal of plastic, glass fiber and electronic equipment is used to achieve lightweight construction and still maintain accuracy.

In sharp contrast to the 21-in.-diameter, 21-ft.-long standard submarine-launched torpedo, the MK 44 will be about a foot in diameter with a length of about eight ft. Two contra-rotating propellers which have a blade length of approximately two inches, but with an extreme pitch, are apparently cast of a lightweight metal such as aluminum. One annular stabilization ring is mounted at the rear of the fish.

According to the best guesses, the MK 44 will be rocket-assisted as is the MK 43, and can also be air-dropped or helicopter-launched. It is said to be quite reliable, but is intentionally not so refined as to be able to strike a beer can on the bottom of the sea. "Otherwise," said one engineer, "the enemy might litter the whole damned area with beer cans." However, the MK 44 is persistent—one model under evaluation reportedly made 13 passes at a target before scoring a hit.

The number of antisubmarine weapons using rocket power is growing. The *RAT* is actually an elementary form of rocket-boosted weapons, but future variations will be much more sophisticated and effective. ASROC, or antisubmarine rocket, a greatly advanced type of rocket-assisted torpedo, is being developed by a number of contractors, among which is GE, one of the bigger torpedo producers.

ASTOR, antisubmarine torpedo or atomic submarine torpedo, is a multi-mission weapon capable of carrying an atomic payload. It is believed to be based on a vehicle the size of a MK 18 torpedo. On this weapon system, the interchangeable warhead could be designed to accomplish a variety of tasks. One mission of the atomic-warhead torpedo would be as a supersubmarine killer with a great kill radius.

• **Propellers still tops**—Despite the exotic experiments being undertaken with underwater rocket-powered torpedoes using widely acclaimed infrared detection, there seems to be little immediate future for any operational weapons except those utilizing propeller-driven torpedoes guided by acoustics. Recent advertisements in trade magazines have praised the efficiency of underwater infrared detection, but information is lacking due to "security."

General Electric is understood to be testing an underwater shape with speeds in excess of 100 knots. It is apparently finding difficulty in effectively utilizing this speed.

The *Caribe,* another proposed antisubmarine weapon, would be a very fast, small torpedo with a light payload that might not sink a battleship, but would certainly punch large enough holes in a submarine to make it impossible for the submarine to voluntarily remain submerged long—if it expects to come up at all.

A major scientific complaint that has been made against Navy policy in the realm of ASW is the inbreeding that results from refusing to let industry actively take a part in basic approaches to the problem. There is no corresponding competition such as exists in the aircraft industry. Most torpedo development work is done by regular Navy installations, and the results are given to industry for development and production.

The Navy's past doctrine of having a strong "force in being" to combat war when and where it should occur has withered. This policy has now been most closely associated with the Air Force, while the Navy develops new weapons for antisubmarine work, produces a few at its Forest Park, Ill., Naval Ordnance Plant, and then puts the "production package" on the shelf to await a war.

The seagoing Navy thus gets a few new weapons to train with and conduct exercises with, but a wartime quantity is not expected to come through until wartime. The Navy, in the words of torpedo experts, is "expecting to win the next war the way we won the last one—through a huge production effort after hostilities have started. I wonder when they'll realize that they will fight the next war with what is actually in their hands on the day war breaks out?"

One of the prime causes of this situation is the severe budget limitation placed on the Navy. There is little reason to believe that the Red undersea fleet is any less dangerous than the air fleet. Projects like the HERALD system may detect a number of these submarines, but what operational weapon can prevent their success?

Vanguard—Long Countdown Succeeds

by William O. Miller

An important check point in the long countdown called Project *Vanguard* was written off as a complete success March 17 with the launching of a small test ball.

The St. Patrick's Day shoot was but one of the thousands of check points in the *Vanguard* program, which began over two years ago, and will continue for almost another year. As in the launching of a single vehicle, difficulty with any one of the components or adjustments delays the firing, so did the two previous tests temporarily halt the forward movement of the program.

Although the two previous attempts—one in December and one in February—did not place a satellite in orbit, nor even prove the launching vehicle, their failures were not unexpected and each of them contributed to the successful shoot.

The fact that the two previous shoots were in actuality "tests" seem to have been lost to the general public. Even on the day of the successful launching, Dr. John P. Hagen, Director of the project, declined to promise that the next scheduled launching would be successful.

However, the conditions under which the scientists and technicians of the Navy, the prime contractor—The Martin Company, and the International Geophysical Year worked for the last five months preceding the successful launching were most difficult in an almost unprecedented way. For almost two years the *Vanguard* program had progressed according to the plan of the U.S. National Committee for the IGY. Then, with the Russian announcements of *Sputnik* I and *Sputnik* II the *Vanguard* team was committed publicly by the highest office in the nation to a delivery incompatible with any scientific endeavor, particularly of an experimental nature. While this had little effect on the actual timing and scheduling of tests, the psychological pressure brought to bear on those responsible cannot be ignored.

• **Actually On Schedule**—Significantly, even with the two unsuccessful attempts, Project *Vanguard* is but very little behind schedule, as it was outlined over two years ago. At that time it was announced that an attempt would be made in the spring of 1958 to place a satellite in orbit. At the time, that in itself was a bold statement in view of the experimental nature of the project.

In any event, it is apparent that the old saying "nothing succeeds like success" is still valid. From a public apathy bordering on ridicule and threats of congressional investigation, the March 17 shoot has brought to those responsible the justified admiration of the scientific world and the renewed confidence in the free world's ability to take its place in space. Now it is acknowledged that never before in the history of rockets has such a complex and sophisticated vehicle gone from the drawing board to orbit in such a short time—a little over two years. This is even more impressive in view of the fact that *Vanguard* embodied many untried concepts and innovations, and did not have an unlimited budget. In brief, *Vanguard* delivered the planned payload with the planned thrust, with a little to spare, and within reasonable margins of the time scheduled.

• **Fired As Planned**—In discussing the launching, with m/r J. Paul Walsh, Deputy Director of *Vanguard* and the man in charge of the team at Cape Canaveral which launched the vehicle, said components and fuels used were as originally planned and that contrary to a rumor, no high energy fuels were used in the first stage. He went on to say that the vehicles to be used in the other seven firings scheduled for the remainder of the program will be basically of the same design as the one which put the 3.25-pound test ball in orbit.

"Success or failure is dependent on so many small things," Walsh said, "One small valve failure can spell failure for the entire operation."

Voicing the sentiments of the entire team he concluded:

"Months of extremely hard work and analyses of troubles have finally paid off."

All seven of the remaining satellites to be used will be equipped with the environmental study equipment which will measure and transmit information on air densities, temperatures, contact with meteorites and erosion effects. Actually, the test ball put in orbit March 17 was an extra dividend, as the firing was mainly to test the launching vehicle. The next launching will attempt to place the first *Vanguard* fully instrumented scientific satellite in space. All seven also will embody the Minitrack equipment for determining the positions of the spheres in their pre-determined orbits. All the spheres except one will be 20-inch magnesium spheres supplied by Brooks & Perkins Inc., of Detroit. The exception will be a 13 inch sphere of fiber glass laminate to be used in measuring the intensity of the earth's magnetic field.

• **Four Experiment Groups**—All of the information the scientists will seek falls into four categories at present. The final decisions as to just what components and experiments will be built into each satellite will be determined by the U.S. National Committee for the IGY. Actually, there are more proposed experiments and their necessary components than can be put into the remaining seven satellites.

As of now, the following information will be sought:

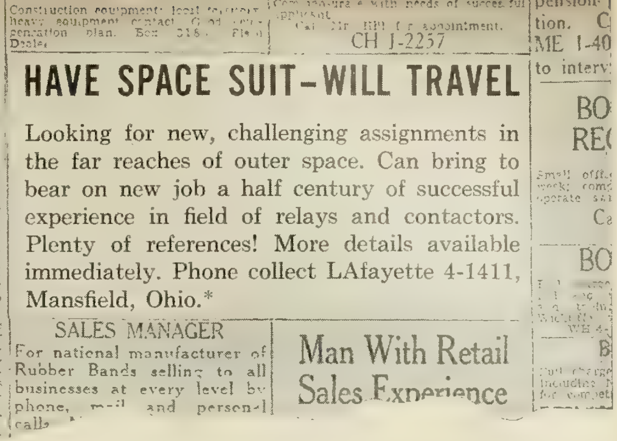
Group I—Measurement of the solar radiation in both the Lyman Alpha range and the X-ray spectrum. Two of the packages (the actual test sphere and a spare) will incorporate X-ray detectors in place of the Lyman Alpha detectors. Here, as well as where required in the other spheres, the Naval Research Laboratory will provide the sphere shell, the telemetering system, the Lyman Alpha detectors, telemetry, transmitter and antenna system.

Group II—Measurement of the cloud cover of the earth. By use of two infrared optical systems, the distribution and movement of clouds covering the earth will be determined. The optical system and telemetry is being developed by the Evans Signal Laboratory.

Group III—Measurement of the earth's magnetic field above the ionosphere. This is a NRL experiment, Dr. James Heppner in charge. The measurements of the magnetic field intensity will be accomplished through use of the fiber glass laminate sphere and a magnetrometer amplifier to be supplied by Varian Associates.

Group IV—Radiation balance experiment. This experiment, under Dr. Verne Suomi of the University of Wisconsin, will measure and compare solar energy or radiation from the sun to the earth and the radiation emanating from the earth, covering most of the range of the sun's energy. Detectors and telemetering encoders will be supplied by the University of Wisconsin.

In the original planning, Group II was the cosmic ray experiment which was developed by the State University of Iowa. This experiment was incorporated in the *Explorer* I launched by the Army. It also was included in *Explorer* II, which didn't orbit.



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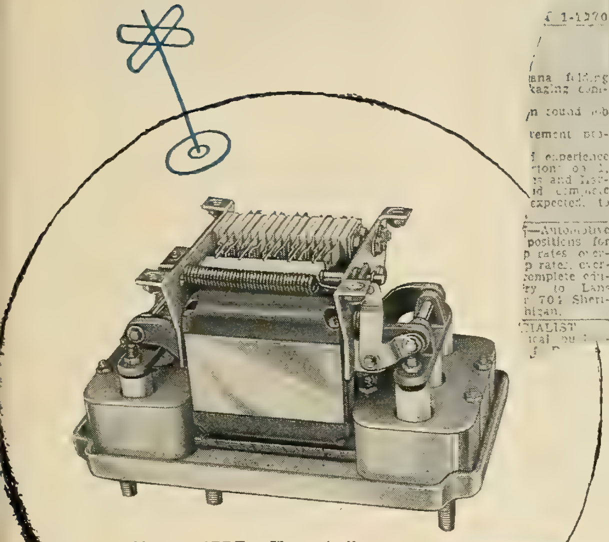
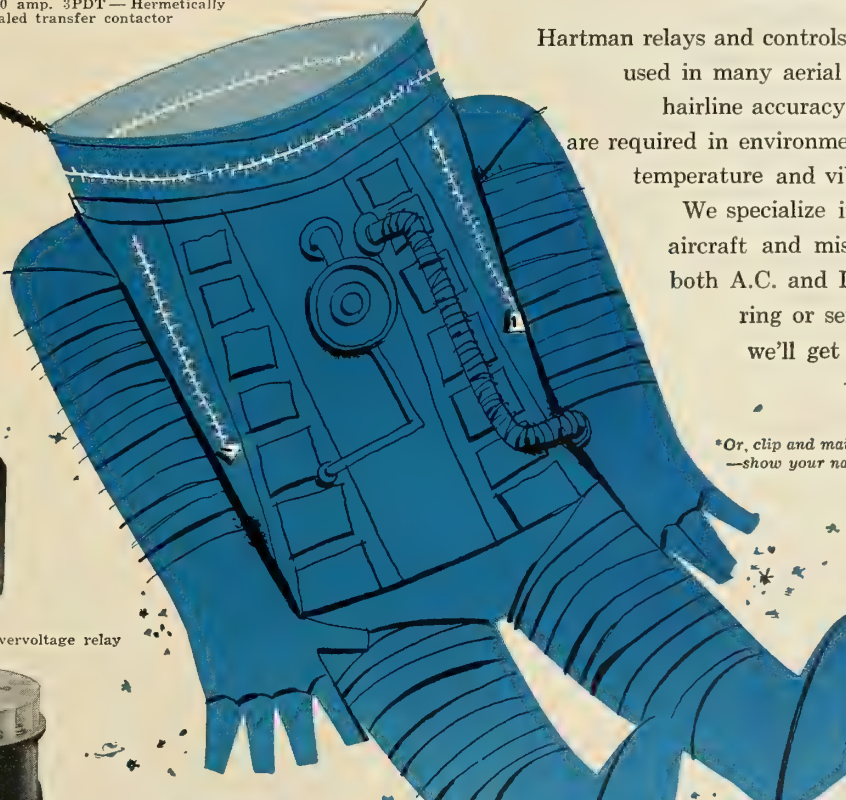


120 amp. 3PDT — Hermetically sealed transfer contactor



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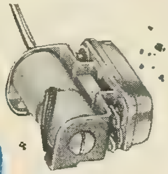
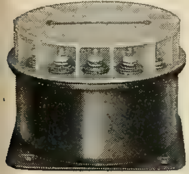


Control Relay — SPDT — Hermetically sealed contacts



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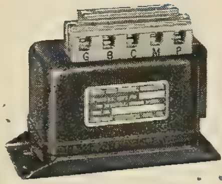
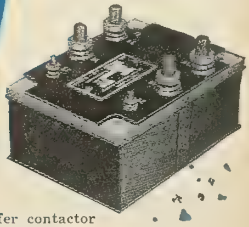


Hermetically sealed field control relay



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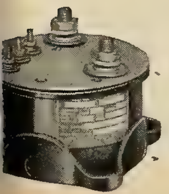

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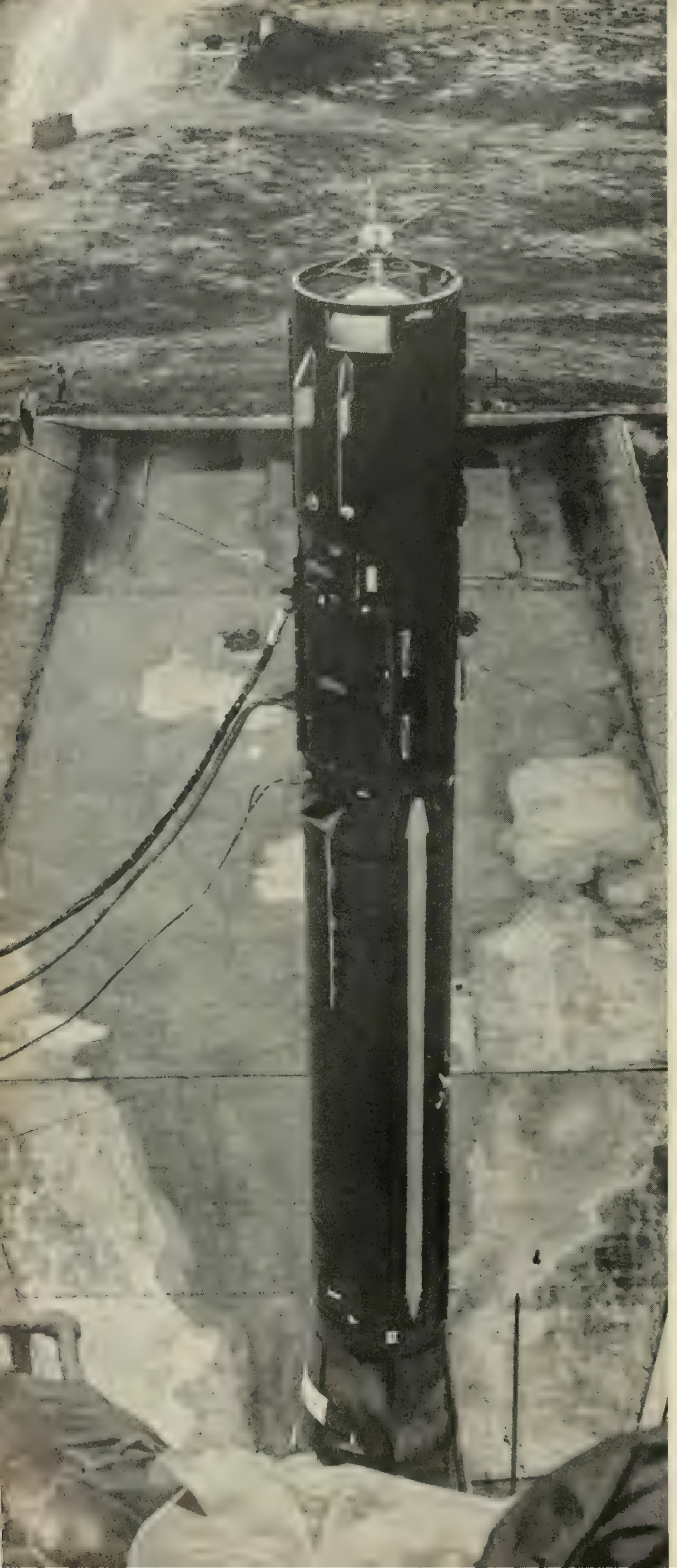


VANGUARD... the U.S. Missile in the News

Patience and perseverance paid off on St. Patrick's Day for the *Vanguard* program. TV-4, the sixth in the series of test vehicles, roared from its pad at 7:15.41 AM and successfully launched its baby satellite into an honorable orbit.

Shortly before the launching, the Navy reemphasized that the small satellite was put into the rocket for purposes other than putting it into orbit. The Navy said *Vanguard* I went along on the flight for the following reasons:
1) To determine by the satellite radio signals the rate of acceleration of the third stage rocket.
2) To test the satellite ejection mechanism.
3) "To take advantage of the *slight* possibility that an orbit might be obtained from a test flight. This, emphatically is not the principal reason for the inclusion of the sphere in TV-4."

Dr. John P. Hagen, project director said that some parts of the *Vanguard* rocket "will surely be used in the more imaginative things that will be done in the next few years."

The total cost of the *Vanguard* to date is $112.1 million. Of this $46.3 million has been appropriated to the Defense Department; $18.4 million to the National Science Foundation; $4.4 million to DOD-Naval Research Laboratory for logistic support; $34.2 million as a supplemental appropriation for the overall program; $2.5 million, "miscellaneous"; $2.1 million for Moonwatch program. Of these totals, the rocket cost (Martin Co.) comes to $47.06 million. And $60 million goes for minitrack

stations, data reduction (IBM), satellites, instrumentation, etc. Chronologically, Project *Vanguard* started out in September 1955 with an estimated cost of $10 million. In March, 1956 this was raised to $28 million; in July 1957, to $110 million and in March, 1958, to $112 million.

Satellite Statistics

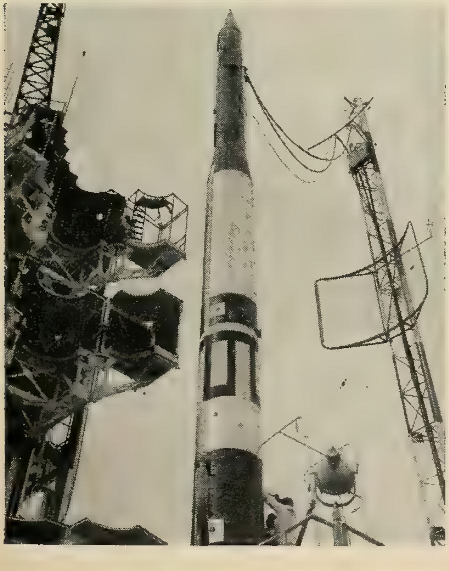
	Sputnik I	Sputnik II	Explorer I	Vanguard I
Size—	22.8" dia.	19 ft. length	80" length	6.4" dia.
Shape—	Sphere	Cylinder	Tube	Sphere
Weight—(in lbs.)	184	1120	30.8	3.25
Length or diameter—(in inches)	23	Unknown	80	6-4
Speed—(mph)	17,660	18,170	18,470	18,000-19,000
Orbit Time—227 miles (in min.)	96.2	103.52	114.95	135
Lifetime—(in months)	3	5-6	24-48	60-120
Perigee—(in miles)	138	132	227	407
Apogee—(in miles)	598	1009	1575	2513
Rocket First Stage Thrust—(in lbs.)	250,000 to 395,000	250,000 to 395,000	83,000	27,000

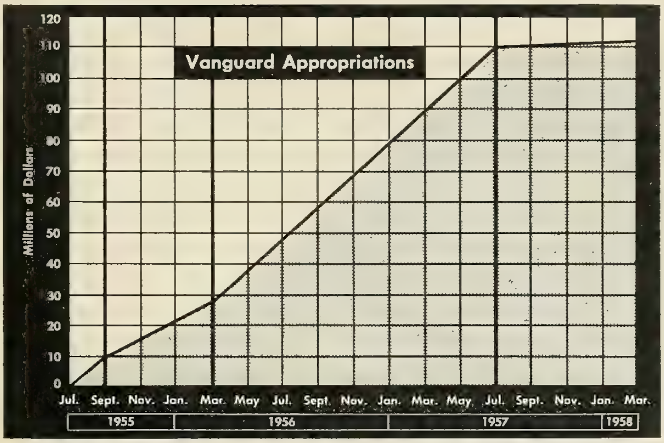
Sputnik I—Launched Oct. 4, 1957. Disintegrated first week in January after circling the earth about 1400 times.

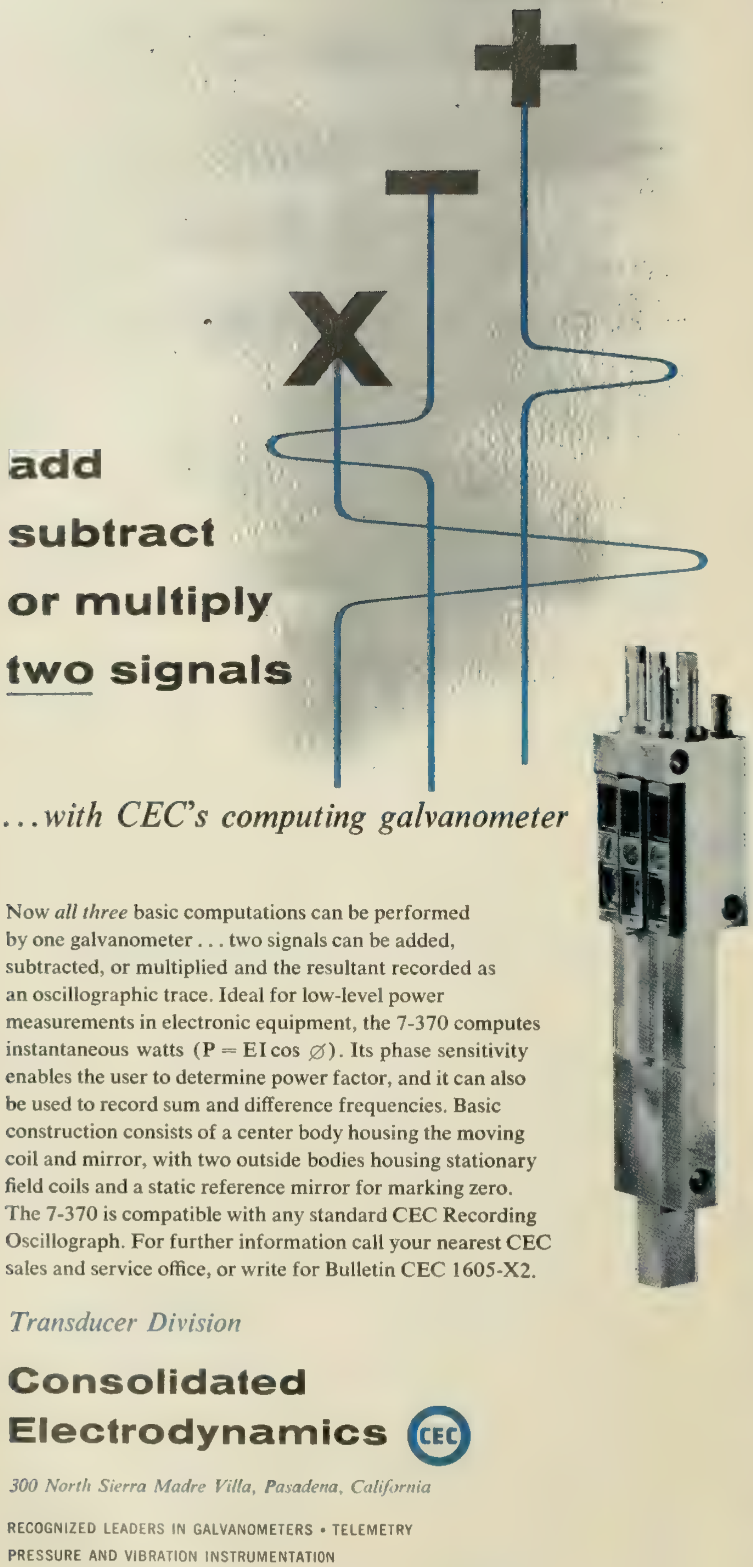
Sputnik II—Launched Nov. 3, 1957. Still circling the earth. Expected to fall in April.

Explorer I—Launched Jan. 31, 1958, 10:58 PM.

Vanguard I—Launched March 17, 1958, 7:16 AM.







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Titan Cooling Units Called Biggest Built

The first of three air-conditioning units to be used in connection with ground operations of the *Titan* ICBM has been completed by the C. G. Hokanson Co., Los Angeles, Calif., for The Martin Co., Denver, Colo.

Said to be the largest self-contained air-conditioning and water-chilling system ever built in the United States, the 25,000-lb. unit was completed just 63 days after receipt of the order from Martin.

Under continuous-duty conditions, the conditioner will deliver temperatures below 0°F, providing ambient design conditions exist. It is said to be capable of delivering moisture-free air to within approximately six grains of absolutely no moisture content, and will perform to the required specifications at altitudes from sea level to 6000 ft. If temperatures are below zero, the unit can heat the air to 120°F. After the desired conditions have been determined, automatic controls are provided to hold the conditions automatically and indefinitely.

Air Force to Launch Animal Satellites

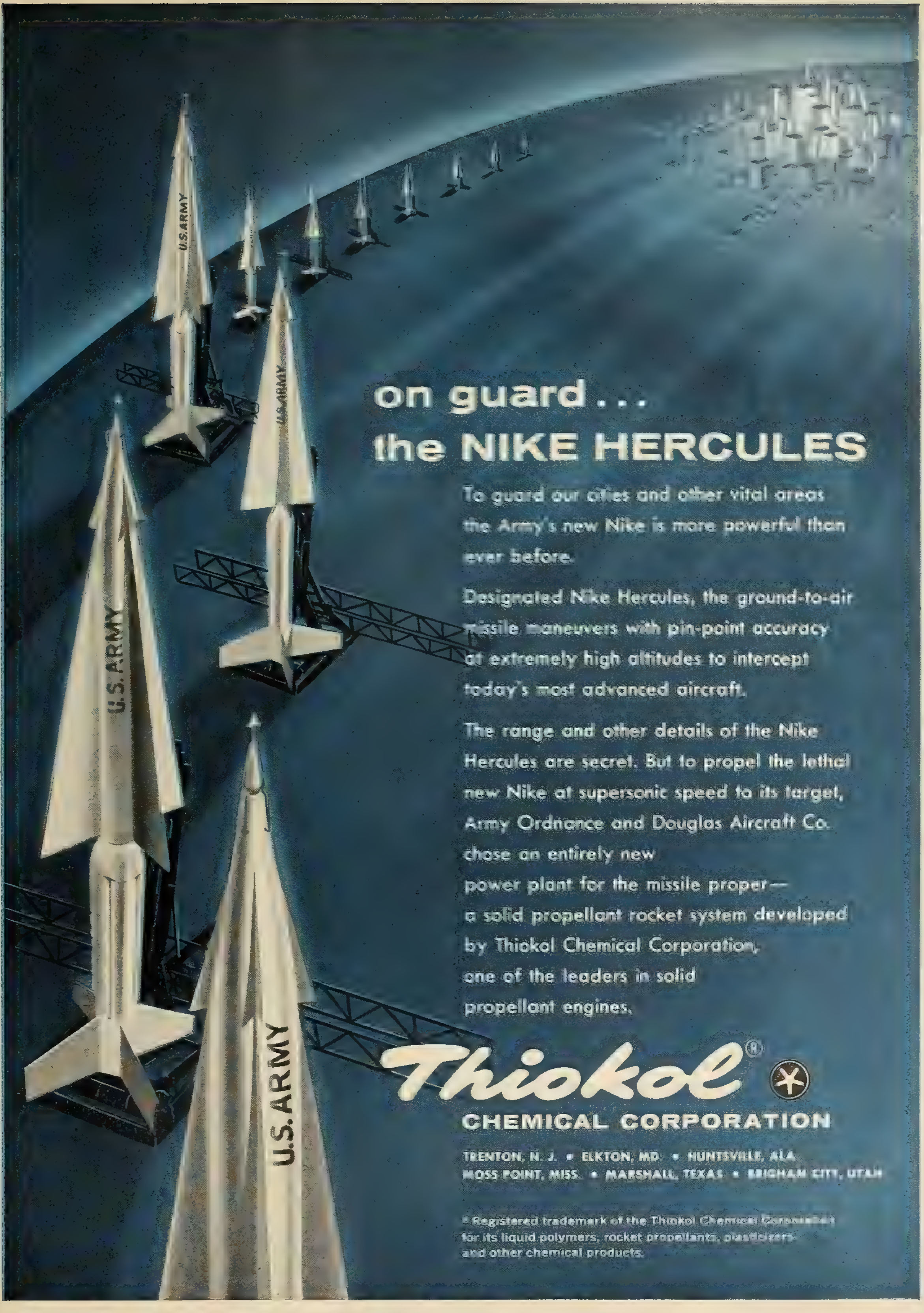
The Aeromedical Field Laboratory at Holloman AFB has requested manufacturers' bids on an animal survival capsule to be ready for launching into an orbit by October, 1958. The capsules, to be less than 24 inches in diameter, are cylindrical and must weigh less than 200 lb. Survival equipment for 30 days must be included. A total of six capsules will be delivered by August, 1958, and will be launched at the rate of one a month commencing in October. Bids will be for study, design, development and production of the units.

Navy to Let Contract for Liquid Rocket Engine

Although the contractor has not yet been announced, the Navy plans to let a contract for a liquid rocket engine to be used as an auxiliary in fighter aircraft.

Details of the competition have not been released but the engine will be a throttlable powerplant designed for installation in the tail of the aircraft. It will be similar to the British *Napier* design, and will use the same fuel as the AR-1 engine developed by Rocketdyne and being tested in the FJ-4F *Furies*. The AR-1 burns hydrogen peroxide and conventional JP-4 fuel.

The aircraft in which the new engine will be used has not been released.



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Range and reliability, two outstanding performance features of the F-101 Voodoo, were dramatically demonstrated during "Operation Sun Run," when three new transcontinental speed records were established. The world-wide acclaim of the Voodoo which followed was a fitting tribute to the many McDonnell teammates, engineers and others, who contributed their skills in creating and developing this fine airplane.

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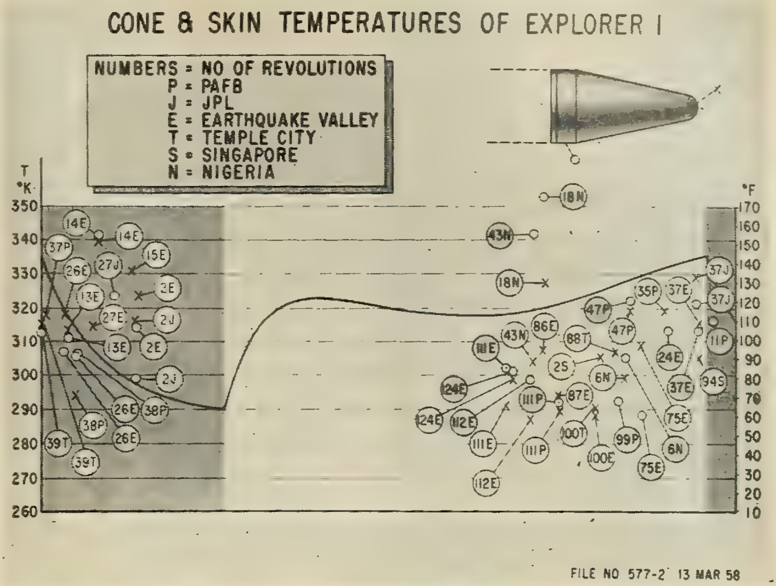
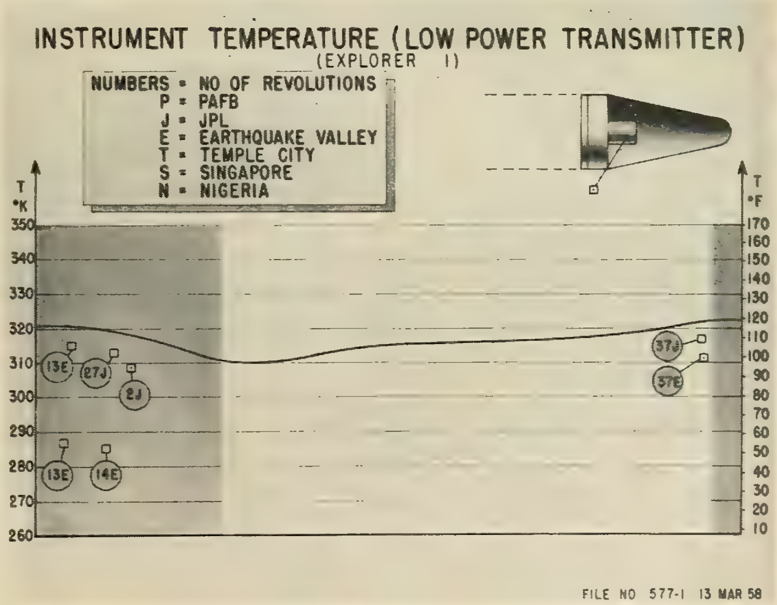
v. Braun Reveals *Explorer* Data





Dallas—At the recent meeting here of the American Rocket Society, Army Ballistic Missile Agency technical director, Dr. Werner von Braun, publicly released for the first time data received from the first U.S. artificial earth satellite—Army's *Explorer I*. Here m/r prints for the first time the plots of temperature readings received from the satellite during its first 124 orbits around the earth.

In the charts above, the continuous line curve represents temperatures as predicted. Shaded areas show where the satellite was in the earth's shadow. The points as plotted show actual measured temperatures. Note that predicted and actual vary considerably from one another. Note also that there are no temperatures which can be considered as excessive in that they would preclude manned space flight. Dr. von Braun said that *Explorer I* has demonstrated that present design (instrumentation, surface coating, etc.) is able to cope with conditions encountered, and that *Explorer I's* readings made it feasible to go head with more ambitious projects.

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missile miscellany

This month, this page is going to start with questions: What ever happened to the Chamber of Commerce committee that, just before October 4, urged a sharp cutback in America's defense budget? Why is it the weekly earnings of workers in the aircraft industry jump sharply each December with no comparable increase in the output curve? What's this about Hughes having a new super-successor for Falcon, and about Grand Central Rocket coming out with a shorter, more lethal Sidewinder follow-up? What's the big deal that Allegany Ballistics Laboratory is getting so proprietary about? And why has the Air Force given Aerojet-General a $3.5-million facilities contract to enable them to get into the missile metal machining business—when there's plenty of this capacity around already?

Elsewhere, this page notes that Thiokol Chemical Corp. has a study contract on Minute Man, with implied assurance of follow-up contracts giving them development and production responsibilities . . . Radford Arsenal has bids out for 500 units of the Nike-Hercules booster with the idea of setting up a third source—and you should see the latter-day missile-makers flock to the bait! This page hopes they have some idea of what's involved . . . Tennessee Gas Transmission bought Grand Central Rocket, we hear, in order to diversify into something that would permit it to make more than the seven percent profit to which public utilities are limited . . . Meanwhile Grand Central plans a 50 percent expansion in the next few months; will keep all of its old responsibilities except propellant research which TGT takes over—and another question: Is Grand Central president Bartley going to stay, or has he got something else in mind? . . . And away down south, Army Ballistic Missile Agency has slapped full first priority on earliest possible completion and firing of TV reconnaissance satellite using RCA electronics system . . . Thiokol is reported to have gotten the solid-propellant booster contract from Boeing for Bomarc . . . Rohm & Haas has got the Nike Zeus propellant research program . . . Things seem to be livening up a bit . . . At ABMA crash programs are red-stamped "BLASTS."

AF has slapped a security classification on the new-type accelerometer developed by the Byron-Jackson division of Borg-Warner . . . And from B-W's Ingersoll-Kalamazoo division, word of encouraging progress on a new super-light, high-strength thin-wall casing that requires no machining; and of a revolutionary planetary ground-support vehicle that's amphibious by nature; does away with conventional wheels and troublesome "cat" tracks; and provides a vibration-free stable platform at 70 mph over plowed fields . . .

And AVRO-Canada's "flying saucer" is back in the news again with rumors running rampant, even including that it is powered by magnetic ion propulsion and is flying. Whether this is true or not, that it is on the verge of a major success seems virtually certain—backed by renewed AF interest and money . . . Diversey Engineering is making successful nose caps for Jupiter with a combination of hydrospinning and contour machining . . . This page also hears where pyroceram is being chem-milled.

PROPULSION

Long-range ballistic missiles and space vehicles impose unusually severe demands on the ability of current technology to achieve close tolerances and high performance. Examples of the stringency of these demands are found in auxiliary power supplies and in the monitoring of propellant consumption to obtain minimum burnout weight.

Auxiliary Power Supplies

Several positions are open for graduate engineers with five or more years of experience in rotating machinery development, and an interest in technical management responsibilities, including contractor liaison and test planning.

Propellant Utilization

Opportunities are available in project management of propellant system development for graduate engineers with extensive experience in aircraft or missile design and flight testing.

Inquiries regarding these opportunities are invited.

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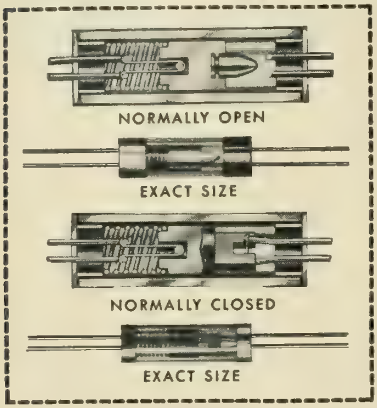

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Outer Space Base?

Navy—Supervised base readied at Point Arguello

Point Arguello—the latest in the galaxy of space names—probably will be this nation's takeoff point into outer space. That's the name the Navy's new Naval Missile Test Facility probably will bear.

Point Arguello NAMTF is coming into being on the 19,000 acres of the Army's old Camp Cooke which has been turned over to the Navy as part of the expansion and development of the Pacific Missile Range. The almost 100,000 acres of California real estate, coupled with the vast tracking facilities of the Navy's Point Mugu Naval Air Missile Test Center, will provide the United States with tremendously expanded facilities for development and testing of missiles and rockets of all services and all ranges.

The West Coast site offers several distinct advantages over the limited capabilities of the Cape Canaveral setup on the East Coast. Primary among these will be the capability of polar or north-south test firings of IRBMs and ICBMs.

Southward of Point Arguello, the nearest land is the Antarctic continent some 10,000 miles away. Habitable and populated areas to the north and south of Canaveral prohibit such tests on the East Coast. There are no space limitations as imposed by Canaveral's 12,000 acres.

Furthermore, the facility, just to the north of the Los Angeles area, places it next door to major missile manufacturers. All these advantages and the already highly developed Navy instrumentation at Point Mugu make the site ideal. The Navy, meanwhile, is planning expansion of the tracking facilities not only for the longer range north-south tests but for testing shorter range missiles on the Pacific range.

- **Canaveral continues**—Although the West Coast site offers many advantages, Cape Canaveral will continue as an important testing base. One distinct advantage the Florida base has is its capability for test firings to the east, taking advantage of the rotation of the earth and getting an object into orbit approximately 1000 mph faster. In any case, as the nation's missile and rocket programs grow, additional testing facilities and ranges are mandatory. Consequently, both the Canaveral range and the Pacific range are highly desirable.

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tion of the Point Arguello facility will be to serve as a missile test and training base for the Navy, and provide facilities for the Pacific Missile Range in support of the Services' joint use of the range. The Air Force rapidly is developing the adjacent Cooke Air Force Base facilities as a missile training base.

- **Details due**—Details of the agreement under which the three services will use the facilities have not been announced. However, it is anticipated that the commander of the Navy's Point Mugu NAMTC, Rear Admiral Jack P. Monroe, will be more than just housekeeper and administrator and will have responsibilities and duties even broader than those exercised by Maj. Gen. Donald Yates of the Air Force at Cape Canaveral.

The complement of the Navy's Point Arguello facility initially will be 3 officers, 16 enlisted personnel and 4 civilians. Upon completion in the early 1960s personnel probably will number more than 1000.

The prospective commanding officer of the new facility is Cdr. Allen Rothenberg, a native of Newark, N.J. who calls Washington, D.C. his home. He was commissioned upon completion of flight training in 1941 and is a highly decorated veteran of World War II. Since July 1956, Cdr. Rothenberg has been deputy for administration to the commander of the Point Mugu NAMTC and the commander of the Pacific Missile Range, RAdm. Monroe.

Plastics Find Greater Use In Rockets and Missiles

Rapidly increasing capabilities to withstand higher temperatures and erosion indicate plastics will play an even more important role in the development of missiles and rockets, those attending the 14th annual National Technical Conference of the Society of Plastic Engineers were told by various industry representatives. Several new plastics also offer distinct advantages in missile tooling and where there is radiation danger.

Among those appearing on the program were Norman B. Miller and Eric L. Strauss of The Martin Company, who discussed the effects of high temperatures and erosion on reinforced plastic laminates. The Martin engineers said that above 250°F reinforced plastics lose strengths slower than aluminum, and that they have improved erosion-resistant characteristics. Conclusion drawn from tests in-

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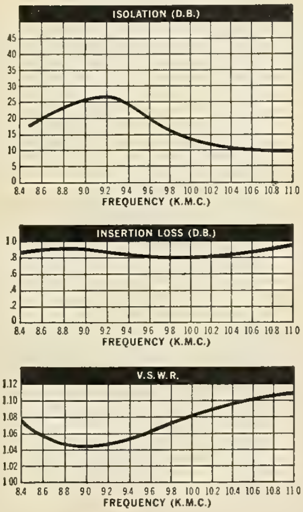

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dicate damage in high-velocity air streams during the first 18 seconds is largely on the surface and that phenolic laminates can withstand 300°F for 60 seconds. Further, laminates form a protective burned surface. It also was pointed that while they are more stable, silicones have poorer strength characteristics. Polyester-glass laminates do not perform well at high temperatures, for short time uses and no effective surface coatings have been found, they concluded.

X-15 Production Details Show Space Flight Cost

Recently released information on the Mach 5, 150-mile high North American Aviation X-15 space flight rocket research vehicle provides a glimpse of things to come. Skinned and winged entirely of nickel-chrome stainless steel the manned rocket plane is a 65% welded structure, using both automatic fusion and resistance welding. Its skin side panels are chem-milled.

Other construction techniques on the X-15 include the brazing of all hydraulic connections; the enclosure of lines, controls, wires, plumbing, actuators, etc., in protrusions running down each side of the fuselage; inclusion of extension refrigerated air systems to combat X-15's operational temperature environment which ranges from plus 1,000°F down to minus 300°.

Reaction controls to enable maintenance of altitude in airless space will be hydrogen peroxide powered and include jet reactors in the nose for pitch and yaw control and in the wingtips for roll control. It is expected that X-15 will be flown during 1959.

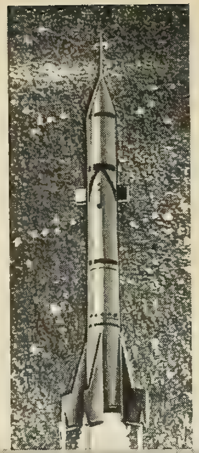
Meanwhile, Pentagon is reviewing 10 proposals for boost-glide rocket bombers and expects to pick three for advanced engineering studies by May 1. Bell Aircraft and Convair are running neck and neck for first place.

USAF Academy Cadets to Study Astronautics

The U.S. Air Force Academy has added a Department of Astronautics to teach the fundamental physics of manned and unmanned space flight.

Through the six-semester-hour course, the Air Force said, it hopes to "develop an appreciation of the engineering and military compromises which must be made in the creation of a new weapon system."

Rocket-powered vehicles, including ballistic missiles, satellites and space vehicles, will be studied to illustrate



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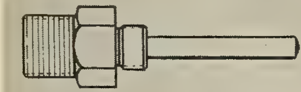

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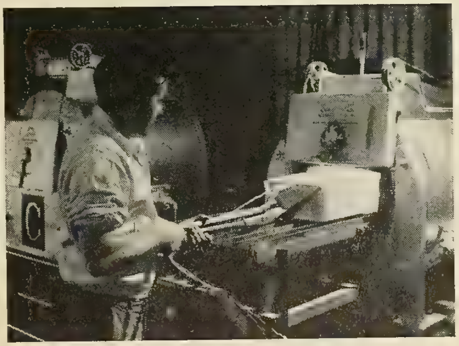

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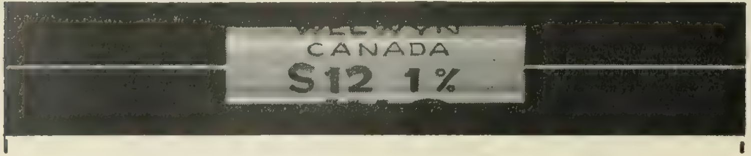

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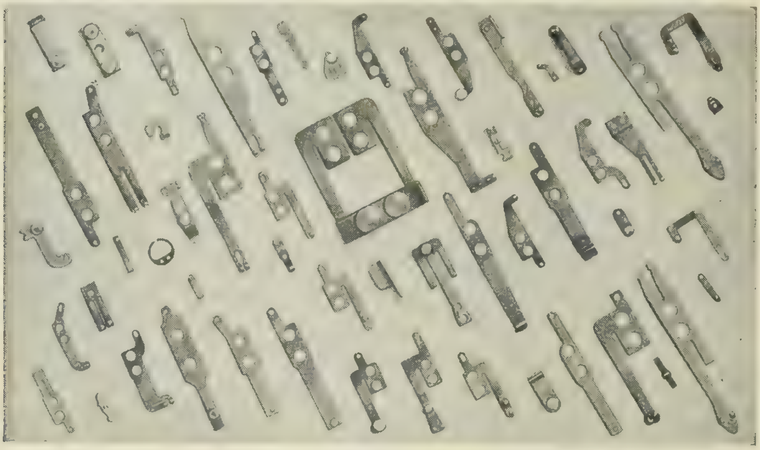

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the design process and how it is influenced by both technological and military considerations. Topics to be covered include stabilization and control of rockets, guidance, atmospheric re-entry, landings on celestial bodies in the absence of an atmosphere, survey of test techniques, and case studies of specific airborne and astronautical weapon systems.

Navigation Achieved for *Polaris* Submarines

The Ship's Inertial Navigation System (SINS), under development for the *Polaris*-equipped submarines, is reported by the Navy to have achieved the necessary degree of navigational accuracy to assure success of the Fleet Ballistic Missile program.

The SINS is similar in principle to inertial navigation systems used in long-range ballistic missile systems. The system provides precise navigation without reference to the stars, radio, radar, or other external methods of navigation. Essentially a computer, it provides the ship's position in latitude and longitude coordinates, true heading or course, surface speed, pitch and roll information—all to a high degree of accuracy, the Navy said.

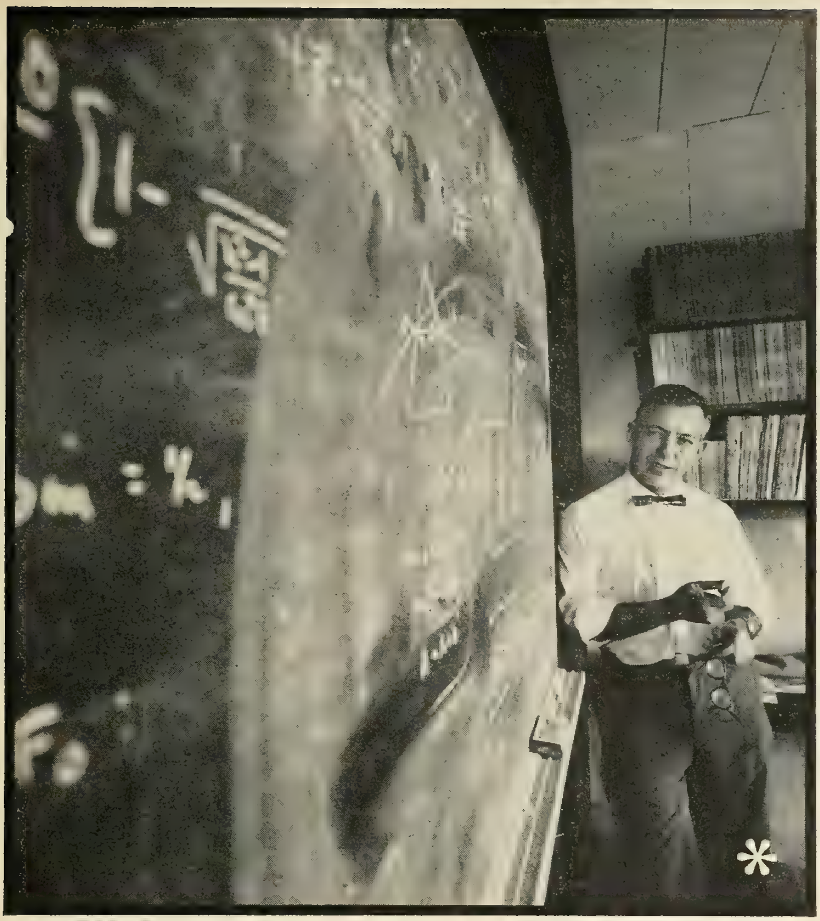
Basic to SINS is its stable gyro platform, or "stable table," which is maintained in alignment with the stars despite the turning and twisting movement of the vessel. The system is susceptible to long-term drift, making occasional reference to celestial fixes necessary. This information is analyzed, decoded and fed back into the system automatically by a Sperry-developed NAVDAC system.

AIA Group Pushes For Central Spec Index

The Aircraft Industries Association's Guided Missile Committee has been pressing the Department of Defense to compile and publish an overall index of specifications applicable to guided missiles, to replace the "incomplete separate service documents now available to guided missile manufacturers," it has been revealed.

The association said a study is now under way to determine the adequacy of guided missile test ranges. Results will be presented to the Department of Defense.

During the past year, AIA disclosed, the number of companies eligible for committee membership has increased 20 percent, because of an increase in the number of member companies who hold prime contracts for complete missiles.



Dr. Eric Clarke, tech/ops vice president, takes a look at a problem in his office at Burlington, Mass.

an oblique look

tech/ops scientists know there are at least three ways of attacking a problem: head on, as an amphibious force hits a beach; flank-wise, as a tactician likes to strike; and *slantwise*, the offbeat way.

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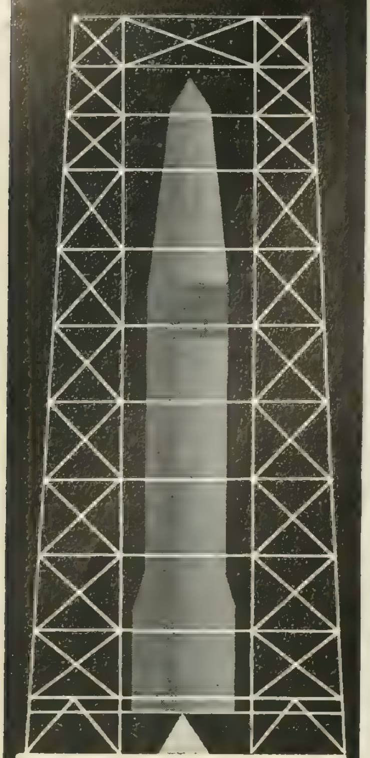

TECHNICAL MANAGEMENT

Ground Support Systems

Technical direction and coordination for the associated hardware contractors engaged in the Air Force Ballistic Missile Program is a major responsibility of Space Technology Laboratories. The scope of this undertaking requires an engineering staff of unusual breadth and competence possessing a high degree of technical management skill.

Several positions are now available for graduate engineers with recent experience in the design, development or testing of missile ground support systems.

Inquiries regarding these opportunities are invited.

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Airborne Launcher for *Lacrosse*

The development of an airborne control system (ABC) for the *Lacrosse* surface-to-surface missile has been reported by Cornell Aeronautical Laboratory. Also under development is lightweight launching and handling equipment to make the system transportable by helicopter.

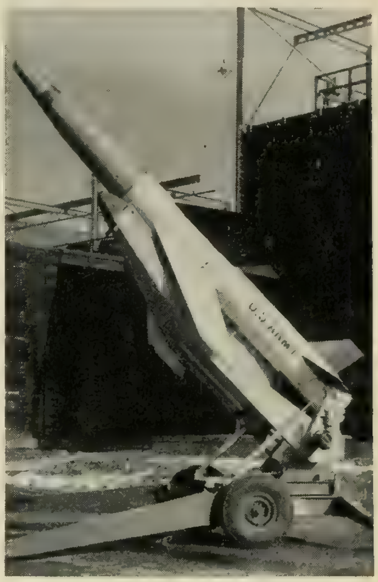
The present *Lacrosse* system, after initial launching from a position to the rear of the combat area, is guided to its target by a forward observer on the battlefield. With airborne control, the missile would be controlled from a position above the battlefield.

Because of its extreme accuracy and high payload, *Lacrosse* makes possible one-shot destruction of such difficult targets as pillboxes. Controlled by a forward observer, the system also can work fast, since it eliminates time taken in transferring target information back to the launching site.

Aerial observation should prove markedly superior in detecting targets, the Laboratory believes. The airborne control program also is particularly suited to the latest concepts of mobility for field armies.

Rapid progress on the ABC project during the past year carried it from study phase into actual flight testing of subsystem assemblies, CAL revealed.

Work on the lightweight launcher also is aimed at improved mobility. According to the laboratory, the specific goal is to make the launcher, as well as other system equipment, transportable by helicopter to strategic points on the battlefield. The present *Lacrosse* uses a launcher mounted on a standard Army truck.



READY FOR ACTION—*Lacrosse* in firing position. The new lightweight launcher is designed specifically for helicopter transportability.

Chrysler Corp. Defends Redstone Cost Figures

Chrysler Corporation has defended its use of "time and materials" subcontracts for the Army's Redstone missile which the General Accounting Office reported to Congress had resulted in "unreasonably high" prices for Redstone parts.

Chrysler said it used that type of contract in the best interest of the missile program until realistic predetermination of cost could be achieved.

GAO had criticized subcontracts totalling 124 million dollars awarded by Chrysler. The price paid was based on estimated labor costs, overhead, profit and material. "Time and materials" subcontracts often are used in early development stages when it is difficult to say how much a part should cost. Such contracts were justified at the start of the Redstone work, GAO said, but later should have been shifted to fixed price contracts.

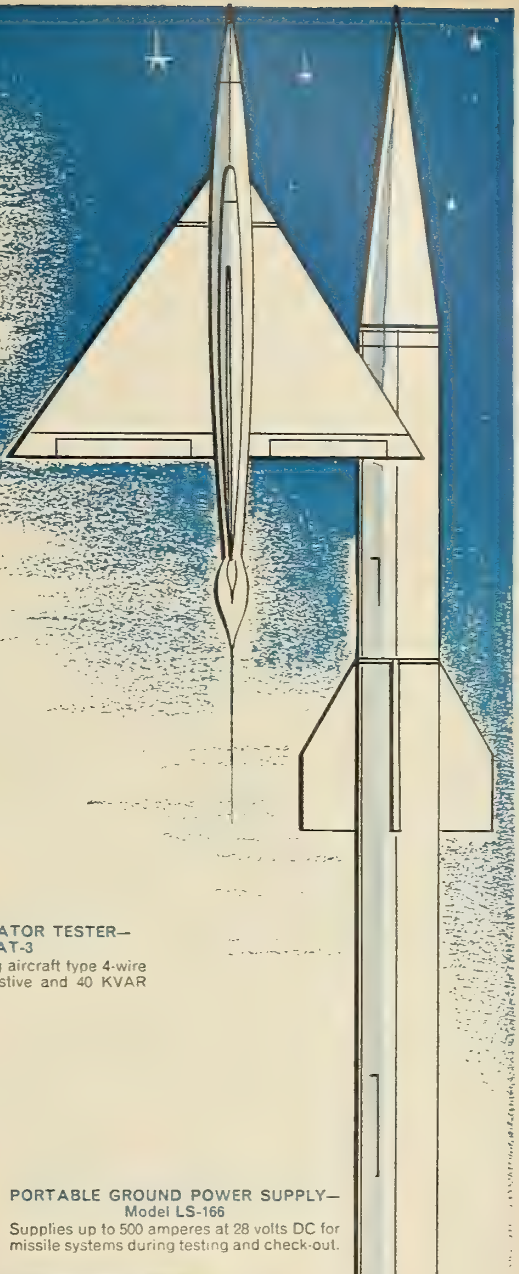
Bomarc Officers Complete First Phase of Training

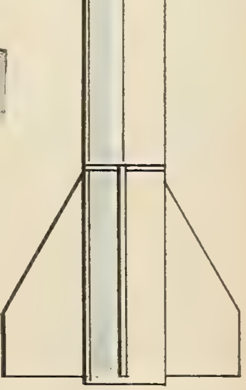
The first group of Air Force officers to receive training on the *Bomarc* missile have completed the first round of technical instruction in operational use of the Mach 2.5 surface-to-air missile.

The officers, selected for this five-month maintenance engineering seminar, are attached to the recently formed 4751st Air Defense Missile Wing, 73rd Air Division, Tyndall Air Force Base, Fla. The officers have received their training at a special Boeing Airplane Co. school in Seattle.

These missile wing officers are being given actual "on the job" assignments in Boeing's Pilotless Aircraft Division for several months. Following this, their training will carry them to the *Bomarc* test firing unit at Cape Canaveral, Fla., and then to the *Bomarc* operational testing base.

SPACE AGE TEST EQUIPMENT





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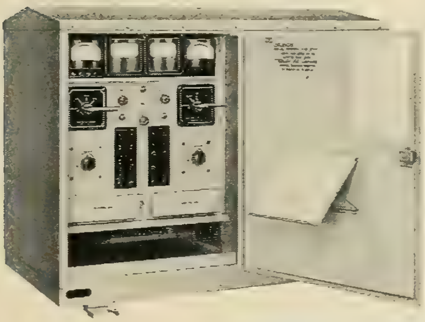

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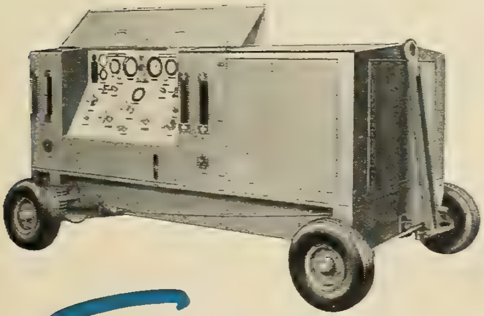

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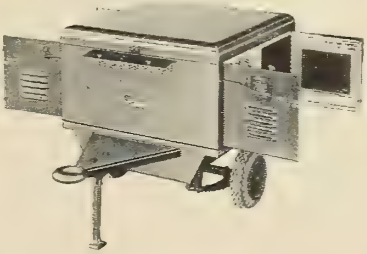

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Conservative White House Report On Space Flight Objectives

Proposed legislation designed to assure civilian agency control of outer space programs was due to go to Capitol Hill from the White House as m/r went to press.

Indications at press-time were that the proposal would define the place of the National Advisory Committee for Aeronautics in an outer space research program. Best guess was that a new agency using NACA personnel and laboratories as a nucleus would be recommended.

At the same time, a report by the President's Science Advisory Committee entitled an "Introduction to Outer Space", was made public with President Eisenhower's blessing. The report, in conservative, non-technical terms, defines both the interest of civilians and of the military in outer space, laying emphasis on the importance of space exploration in solving problems of communications and meteorology.

There was a tendency, in the report and the President's comments, under present conditions, to down-grade the value of space vehicles as weapons carriers. The committee said "In short, the earth would appear to be, after all, the best weapon carrier."

A timetable of scientific objectives stated only in terms of early, later and "still later" time scales is included with the explanation that specific timing will depend on the level of effort—that space research must not foreclose the continuation of research of a more prosaic and earthly type.

The committee, in concluding the report said: "it would not be in the national interest to exploit space science at the cost of weakening our efforts in other scientific endeavors. This need not happen if we plan our national program for space science and technology as a part of a balanced national effort in all science and technology."

As for the current effort, the committee warned that rocketry and other equipment used in space technology must usually be employed at the very limit of its capacity. This means failures of equipment and uncertainties of schedules are to be expected. "It therefore appears wise to be cautious and modest in our predictions and pronouncements about future space activities—and quietly bold in our execution," the report stated.

1st National Missile Meet Set June 4-6 at Washington

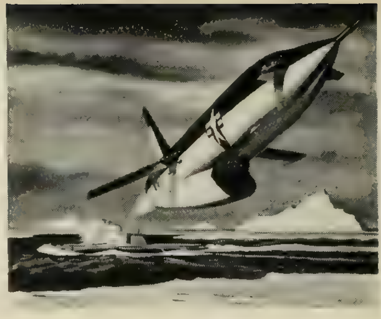
The National Rocket Club of Washington, D. C., has announced that the First National Missile Industry Conference will be held on June 4 and 6 at the Mayflower Hotel. The Aircraft Industries Association and the National Capital Section of the American Rocket Society have been invited to participate.

The NRC, which started as an informal monthly luncheon club, is a non-profit organization. Among its members are men from the Department of Defense, the three military services, the House of Representatives, the Senate, the rocket and missile industry and the press. Objective is promoting advancement of U.S. missile and astronautics programs.

Purpose of the First National Missile Industry Conference is to enable missile businessmen to get together with the experts and discuss their mutual problems. Meetings for the three-day session will be in the form of panel discussions, and topics discussed will be sales, procurement, subcontracting and business forecasting—all in the missile, rocket and space flight field. Participants in the panels will represent Congress, the Department of Defense, industry and the press.

Highlighting the conference will be the Dr. Robert H. Goddard Memorial Dinner, to be held on Friday, June 6, when various awards will be presented for outstanding contributions to the missile industry. One of these will be given by Wayne W. Parrish, President, American Aviation Publications, Inc.

Two leading missile manufacturers also will present awards. Proceeds of the dinner will be turned over to the Dr. Robert H. Goddard Fund of the Guggenheim Foundation. Thomas Wilcox, Rocket Club Executive Secretary, 1013 Woodward Bldg., Washington 5, D.C., is coordinating conference activities.



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Aero or Thermo Specialist. Aeronautical or Mechanical Engineer with advanced degree plus at least 7 years in propulsion system design, specializing in internal aerodynamics and heat transfer. Special consideration for Mach 4 and above flow study experience. To lead complete studies in this specialty as applied to new propulsion systems.

Lead Propulsion Engineer. Aeronautical or Mechanical Engineer with advanced degree, plus 1 to 4 years experience in nuclear, solid and liquid rocket, or ramjet design. To develop new propulsion systems using nuclear and/or rocket fuel components (solid and liquid). To carry design through preliminary stages and possibly assist project phases.

Staff Engineer, Nuclear Propulsion. Aeronautical or Mechanical Engineer, or Physicist with M.S., plus 10 years experience in propulsion system design, including 5 in nuclear development. Should be equipped to perform all technical design work in connection with nuclear propulsion systems.

Propellant Analyst. Chemical Engineer with M.S. (preferred) or B.S., plus 5 years experience in solid and/or liquid fuel studies. To develop propellants for unique power systems.

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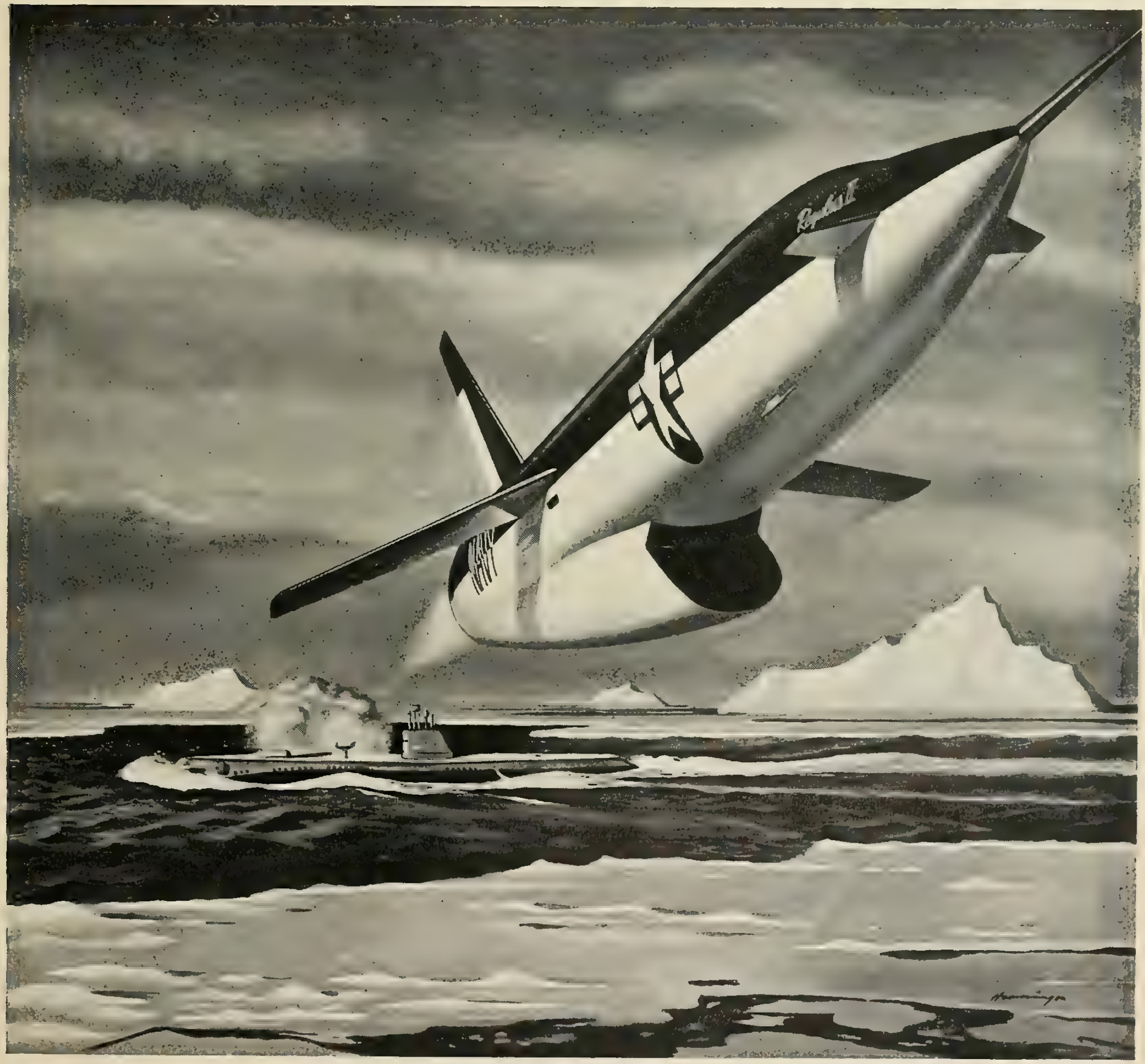

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Miller, Fossen Join m/r Editorial Staff

William O. Miller has joined m/r as associate editor for military and legislative affairs. He formerly headed the radio and television branch of the office of the Chief of Information, U.S. Navy. From 1945 to 1950 he was assistant to the editor of the ATLANTA CONSTITUTION, a staffer in the Atlanta Bureau of the Associated Press and editor and publisher of his own weekly newspaper in Hampton, S.C.

Peer Fossen associate editor, optics and telemetry, comes to m/r from Page Communications Engineers, Inc., Washington, D.C. where he was editor-writer in the publications division. Prior to joining PCE he was associated with Army and Air Force technical publications.

m/r Columnist Receives USAF Civilian Award

Dr. Hubertus Strughold, dean of space medicine and m/r columnist received the Air Force's Exceptional Civilian Service Award during the recent Jet Age Conference in Washington, D.C.

Presentation of the plaque was made by Gen. Thomas D. White, USAF Chief of Staff at the conference banquet.

Advisor for Research to the Commandant of the Air University's School of Aviation Medicine, Dr. Strughold was cited for his "contributions to the complex problems of man's existence in space."

The space medicine expert organized the school's Department of Space Medicine in 1949, two years after his emigration from Germany.

Dr. Castruccio Named To m/r Advisory Board

Dr. Peter A. Castruccio, 32, advisory engineer at the Westinghouse Missile Subsystems Engineering Department, has been named to the m/r Editorial Advisory Board.

Dr. Castruccio, holder of several radar patents with numerous patents pending, is currently engaged in advanced planning of interplanetary electronics communications and navigational aids of the future. He formerly held positions with Bendix Radio and The Martin Co. in the field of military electronics.

The young scientist has written many papers and articles for technical magazines, including m/r. He majored in physics at the University of Sao Paulo, Brazil and won his doctorate summa cum laude in electrical engineering at the University of Genoa, Italy, at the age of 21.

Safety Device Developed for Handling Explosives

A newly developed safety device is giving added protection to research chemists handling hazardous compounds in the search for more powerful propellants.

Designed by Henry Rolewicz of the Redstone Arsenal Research Division of Rohm & Haas Co., the device is a portable shield consisting of three concentric baskets of perforated 1/8-inch sheet aluminum. The ¼-inch perforations are staggered on ½-inch centers to eliminate the possibility of direct passage from the interior. Tests, using up to five grams of "Composition C," have shown the shield will effectively stop all fragments while the perforations permit venting of the shock wave.

The device is most useful in transporting reactors or product receivers from test areas.

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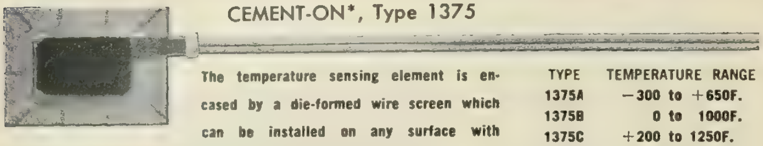
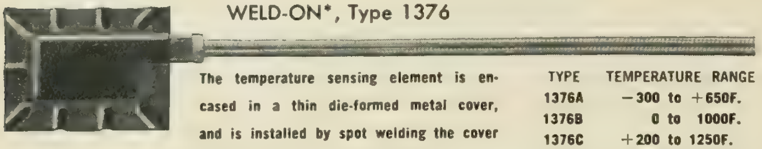


CEMENT-ON*, Type 1375

The temperature sensing element is encased by a die-formed wire screen which can be installed on any surface with TRANS-SONICS Type 64C cement.

TYPE	TEMPERATURE RANGE
1375A	−300 to +650F.
1375B	0 to 1000F.
1375C	+200 to 1250F.
1375D	+500 to 1550F.

actual size



WELD-ON*, Type 1376

The temperature sensing element is encased in a thin die-formed metal cover, and is installed by spot welding the cover to the underlying metallic surface.

TYPE	TEMPERATURE RANGE
1376A	−300 to +650F.
1376B	0 to 1000F.
1376C	+200 to 1250F.
1376D	+500 to 1550F.

- **RANGES:** From −400F to +1550F.
- **OUTPUT:** Up to 5 volts without amplification.
- **RESISTANCE CHANGE:** 100 ohms over calibrated range.
- **ACCURACY OF CALIBRATION:** ±1% of range interval
  ±2% for temperatures over 1000F.
- **MAXIMUM CONTINUOUS CURRENT:** 20 milliamperes rms.
- **REPEATABILITY:** ±0.2% of range interval.
- **VIBRATION:** 1-inch double amplitude, 0-22 cps;
  25g, 22-2000 cps.
- **ACCELERATION & SHOCK:** 100g on all three major axes.
- **LEADS:** Two 6" nickel wires with high temperature insulation.

Trans-Sonics Cement-On Type 1375 and Weld-On Type 1376 Surface Temperature Transducers are platinum resistance thermometers that can be installed on any surface, flat or curved, metallic or non-metallic, for accurate temperature measurement. The protective cover of the resistive element is cemented or welded directly to the thermal surface to form an isothermal system which gives a transducer reading that corresponds to the true skin temperature.

A 5 point resistance-temperature calibration certificate at 0, ¼, ½, ¾ and full scale temperature is supplied with each transducer. A strip of aluminum Thermotape* is also furnished with each unit to provide an alternate means of tape-on installation useful to 800F and under limited conditions to 1000F.

Types 1375 and 1376 are the newest members of the Trans-Sonics family of platinum resistance thermometers for measuring surface temperatures. All units are capable of delivering up to 5 volts without amplification. Write to Trans-Sonics, Inc., Dept. 9, Burlington, Mass. for Technical Bulletin on Surface Temperature Transducers.

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Space Age Conference a Hit in Los Angeles

The Los Angeles Chamber of Commerce struck pay dirt in a big way when it decided to put on a missile show last month.

The 1958 Western Space Age Conference and Exhibit was held March 20 to 22 at the Los Angeles Shrine Exposition Hall. Its theme: The U.S. Missile Market.

Planned by the chamber's industrial market development committee as a possible means of opening the gates to missile profits for the numerous small-size companies, which had been hard hit in the aircraft cutbacks, space for 200 exhibits was mapped out.

These were sold out within hours and another 150 spaces had to be added to meet the demand. When reservations poured in for two $8 luncheons and one $10 dinner (Dr. Wernher von Braun spoke on "The Space Age Time Table" at the latter), arrangements had to be made to accommodate 2000 instead of the originally anticipated 500 or 600.

"It turned out to be one of the most ambitious undertakings ever attempted by the chamber of commerce," said Kenneth F. Julin, president and general manager of Leach Corp. and chairman of the industrial market development committee.

Essentially, the purpose of the event was to bring the buyer and the seller together. About 50 prime contractors had exhibits. Show-stoppers included first public showing of the Douglas Aircraft Co.'s 40′ x 40′ working model of a *Thor* launching site and a scale model of the first U.S. satellite, the *Explorer,* by the Army and the Jet Propulsion Laboratory.

The two-day conference program, held in conjunction with the three-day exhibit, was arranged so that the first day was devoted to the business aspects of the U.S. missile market, with a keynote address by Dr. Lee DuBridge, president of Cal Tech, followed by addresses by Lt. Gen. Clarence S. Irvine, Air Force Deputy Chief of Staff for Materiel; Rear Adm. Jack P. Monroe, commander of the Naval Air Missile Test Center, Point Mugu; Vincent de P. Goubeau, vice president-materials, RCA, and Donald W. Douglas, Jr., president of Douglas Aircraft Co.

Technical sessions were held the second day with panels on such topics as quality control in missile production, metals and missiles, and tooling for missiles.

Emphasis on Flexibility Seen as Key to AF Missile Maintenance

Air Force's experience with an operational missile system in Europe (Matador) has helped to answer a couple of vital questions in respect to missile maintenance.

Chief concern of the policy makers has been whether the special requirements of missiles would necessitate major changes in the present aircraft maintenance organization. There was also the possibility that two separate systems would be required during the few years that manned aircraft will continue to play a prominent offense/defense role in the Air Force.

Two separate systems would be prohibitively expensive and cumbersome, while the entire maintenance organization would result in a long period of transition and a low level of efficiency for possibly several years.

Some surprising facts have emerged from this brief experience with operational missiles. Similarities between aircraft and missiles, in respect to maintenance problems, have tended to simplify the overall picture. In fact, Pentagon officials feel that the transition from manned aircraft to missile maintenance will be no more difficult than adapting the system to improvements in aircraft through the last few years.

One thing is certain, officials point out, and that is that the present system will be considerably streamlined out of necessity, and the overall maintenance organization will be much improved as a result.

Although the basic structure of the organization will remain the same, some minor changes have already been made, and more of them are already in the mill.

- **Retraining is problem**—The major problem in changing weapon systems is that of retraining technicians and specialists. It is here that ground is lost, and efficiency is sacrificed during the changeover.

However, it is also here that Pentagon officials are most enthusiastic. In clarification of this point an official told m/r that at the depot level all areas of missile maintenance can be taken pretty much in stride. As examples he cited sheet-metal work, engine overhaul, and electronics troubleshooting and repair.

Metalworkers experienced on aircraft will encounter no real problems in the same area of missile maintenance. Engines are pretty much the same as those used on high-performance aircraft, it was pointed out, so again no real problem of retraining. Electronics equipment on modern aircraft is as complex and sophisticated as missile guidance systems. As these major areas are eliminated; airframe, engines, electronic gear; the problem resolves itself to one of lower echelon significance.

In this lower echelon of maintenance, the squadron level, the changes taking place are reshaping the overall maintenance organization. But, there is nothing happening here that the Air Force has not had experience in.

Retraining of "flight-line" personnel is something that must be done even in respect to old-type aircraft. The personnel at this level range from people who are new to the service to careerists, and most of the training in either case is for jobs that are performed on or near the flight line. "What difference," one official said, "whether the training is on aircraft or missile; its something we have to allow for."

- **New patterns**—Implementation of missiles as operational weapons has resulted in two new patterns at the squadron and group level, both designed to furnish the important aspects of flexibility and speed.

In the case of *Atlas* there is the combined-squadron, the maintenance and missile launching teams both within the same squadron organization. The same organizational structure is planned for *Bomarc*. There is a possibility that this type organization will be designated a ballistic missile unit.

The units now operational with *Matador* missiles are group level, with a TAC Squadron concerned directly with launching missiles, and maintained by a separate Maintenance Support Squadron. Maintenance squadrons are concerned with Receiving, Inspection and Maintenance (RIM), and Assembly and Maintenance (A&M).

Flexibility is built into the new units in that if the need arises for greater capability from any unit it can be expanded from a single-squadron unit to the group unit, and in the case of a group more TAC squadrons can be added, supported by the same maintenance squadron, and thereby doubling the firepower of a group without changing its basic organizational structure.

Alert teams from the A&M sections can be called to the flight line to make quick changes of control boxes, components or even engines, to keep alerted missiles in a state of readiness. Components removed from flight-line

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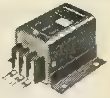
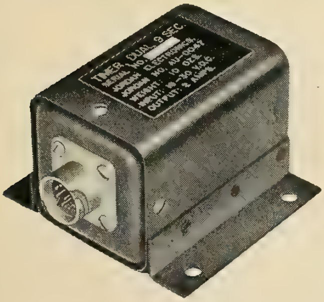

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weapons are repaired in A&M's shops, at the depots, or if all these fail, by the prime contractor.

The byword in missile maintenance has been described as, capability of maintenance as close to the missile site as possible, with rapid and reliable flow of serviceable parts.

Ehricke Predicts Space Flight Timetable

Krafft A. Ehricke, assistant to the technical director of Convair Astronautics, said recently that progress in the current development program of the Atomic Energy Commission will provide practical powerplants for use in 1965-70.

Ehricke presented preliminary designs for a 200-foot, 90-ton, two-stage chemonuclear vehicle that he said would be capable of landing a 22,000-pound payload on the moon or orbiting a 30,000-pound payload around the planet Mars. Carrying a 15,000-pound payload, this vehicle could land a scientific expedition on the moon, with enough fuel remaining to take off, return to the edge of the earth's atmosphere and transfer personnel to a reentry glider.

Ehricke's first stage is a delta-wing glider of 90-foot span, powered with conventional gasoline and liquid oxygen rockets developing 2.7 million pounds of thrust. It would return to earth after boosting the manned second stage beyond the earth's atmosphere.

Power for the second stage is provided by feeding liquid hydrogen to a rocket engine that has a nuclear pile as its energy source. Thrust is obtained by expelling a jet stream of hydrogen atoms from a rocket exhaust nozzle.

Ehricke presented the following timetable for lunar rocket developments, contingent on a concerted national effort:

Phase I, 1958-60—Shooting a rocket close to the moon, then impacting on the surface, circumnavigating the moon, establishing a satellite around it, and making a controlled landing.

Phase II, 1964-66—Landing instrumented vehicles on the moon; sending out manned rockets for lunar reconnaissance; and, in the period 1967-70, landing small scouting parties.

On the basis of findings in this phase, a decision will have to be made whether it is worthwhile to undertake building a permanent moon base, he said. If so, this would lead to:

Phase III, early 1970s—Building a supply system to establish and maintain permanent lunar bases.

for tomorrow's space weapons systems...

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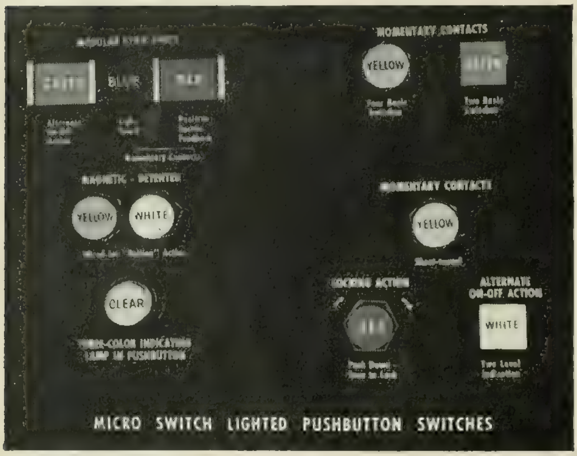
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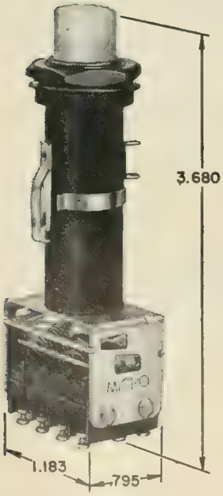
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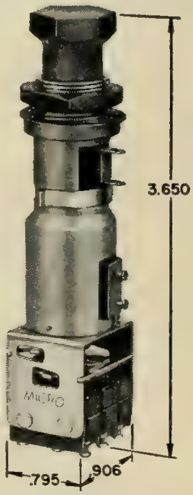
with 52PA5 Button

The "50" series switch, shown at left, is a two position, alternate-action switch. The two level visual indication allows extra flexibility in complex control panels. The position of the button—up or down—indicates the condition of the circuit. An independent indicator lamp is free to give additional information, or it can be wired to go "on" and "off" with the switch.

The "50" series switch, at right, is a unique magnetically held pushbutton. This extremely versatile switch combines multi-circuit switching, indicator light and d-c holding solenoid in one compact unit. When the button is pushed, the switch contacts are held actuated until electrically released. This permits one-by-one "bailing" operation with remote electrical release, allowing complete freedom of panel layout.

These switches are available with two, three or four SPDT contact structures. All lamp and button options may be used. They are rated at 5 amps., 125-250 vac. 3 amps., 30 vdc.

Request Data Sheet No. 133.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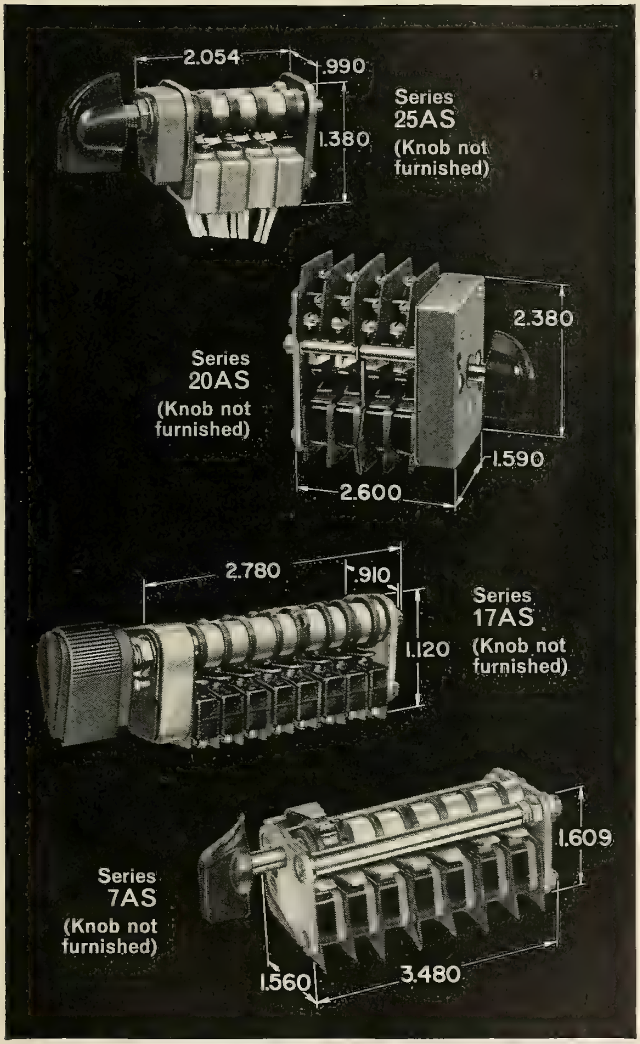
.906

53PB8-T2
with 52PA8 Button

Switches have uses unlimited

SWITCH Precision Switches and Aircraft Instrument Panels



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"25AS" series rotary selector switch assemblies are the smallest available with environment-proof sealed subminiature basic switching units. Assemblies are available with from two to eight SPDT sealed subminiature switches. Optional positive detent positions from 2 to 8. Rated 5 amps., 125-250 vac. 3 amps., 28 vdc.

"20AS" series rotary selector switch assemblies are extremely versatile. Available with 4 to 20 "V3" type switching units. They are compact, sturdily constructed, and highly reliable. Panel sealing and detent positions are optional. Rated 10 amps., 125-250 vac. 10 amps., 30 vdc.

"17AS" series rotary selector switches are small compact assemblies, available with up to ten SPDT subminiature basic switches. 45 degree angle detents are available in 2 to 8 positions. The use of these assemblies reduces instrument panel space. Rated 5 amps., 125-250 vac. 2½ amps., 30 vdc.

"7AS" series rotary selector switches are compact and sturdy assemblies of two to eight SPDT "V3" type switches, ideal for applications requiring multi-circuit control of 10 amp. circuits. Available in 2 to 8 detent positions. Rated 10 amps., 125-250 vac. 10 amps., 30 vdc.

For complete details on these assemblies ask for Data Sheet 86a.

The two-word name "MICRO SWITCH" is NOT a generic term. It is the name of a division of Minneapolis-Honeywell Regulator Company.

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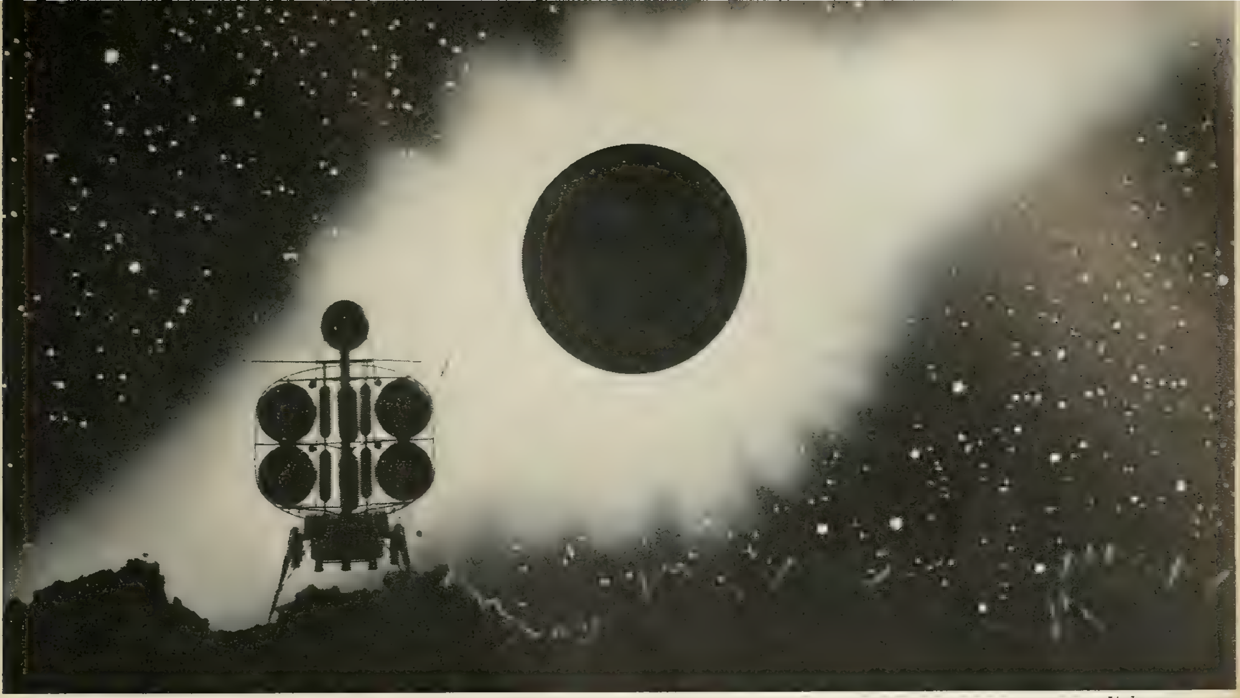

Itokawa

Many unknowns make one answer clear:

Man on the Moon?—Probes Due First

by Frederick I. Ordway, III,*
Ronald C. Wakeford

THIS YEAR man is accumulating scientific information in the general region of one earth radius out into space. He is actively planning to extend the altitude of both research rockets and artifical satellites to several earth radii.

Preliminary attempts may be made this year to impact a rocket on the lunar surface, or to effect a circumlunar trajectory by an instrumented probe. Within six to eight years it may be possible to bring the payload section of such a rocket back to earth, and, perhaps by 1968, we may be able to land a probe on the moon, monitor its takeoff, and guide it back to earth. By 1975 or earlier, it seems reasonable to expect that man himself will be on the moon.

• **Old travel plans**—Serious proposals for moon travel date from the time Tsiolkovski (1895), Oberth, Goddard and other pioneer astronautical scientists began to write on rockets, satellites and space travel.

In a 1930 lecture, France's Esnault-Pelterie could accurately say that the moon journey must be carefully planned and that it would be a rigid, exact matter. He knew that the ship would "start off slowly, so that while we are passing through the atmosphere our speed is increasing as rapidly as possible."

He figured that the top velocity would be reached after "eight minutes of travel, when we are 1200 miles above the earth." This French pioneer was cognizant of space medical problems, suggesting a maximum acceleration of three g's, distributed over the human body in the prone position.

Many of the early moon proposals were based on direct flight from the earth to the moon, while others sought to take advantage of earth-orbiting space stations, from which rockets would ascend to the lunar objective.

• **Newer proposals**—Modern proposals include both techniques, but often assume neither a lunar landing or return to the earth. The following plans are suggested: takeoff from earth's surface; takeoff from balloon platform in outer atmosphere of earth; takeoff from earth-satellite station from 200 to 1000 miles above surface.

A number of flight plans appear possible which might result in any of the following: probe space at lunar orbital distances; impact on the moon; circumnavigate the moon; establish vehicle in orbit around the moon; land instruments on the moon.

Finally it will be eventually desirable to return the moon vehicle to the earth, or at least to the vicinity of the earth. In the latter case we might develop a probe that would circumnavigate the moon, and then return on the leg of a trajectory passing close enough to the earth to enable interrogation of the instrumentation from a surface station.

If this probe could be pro-

**General Astronautics Corp.*

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...Man on Moon?—Probes Come First

grammed to return to the earth's atmosphere, braking and parachute descent techniques could be employed to retrieve the instrumented section. The ultimate stage will arrive when man can fly to the moon, land, take off and return to a terrestrial base with a comfortable supply of fuel and other supplies in reserve.

• **Around the moon**—Krafft Ehricke and others have, in recent years, prepared numerous studies covering important aspects of lunar flight. In one paper, Ehricke and George Gamow have worked out many flight details of a circumlunar rocket, which they postulated would weigh 240,000 pounds and would have a 400-to-800-pound payload capability. Such a vehicle's velocity at the circumlunar end of the trajectory would be quite low, so that much information could be recorded by the instruments.

Of the total trip time of 157 hours, 50 would be under conditions permitting close observation of the moon. Closeup images might be sent to the earth by facsimile transmission techniques. Television recordings could be made on tape and played back when the probe returns to the earth's vicinity.

The term cislunar space has been introduced by Ehricke, to define the general region between the earth and moon where neither body dominates the rocket's path exclusively. This general region of space is significant to artificial satellite mechanics and as terminal points of returning vehicles.

Somewhere between 10 and 25 earth radii, a "flat minimum" exists where perturbations due to terrestrial oblateness and to the moon are small. At 125,000-150,000 miles out, the moon begins to become a strong perturbing force.

• **Navigation problems**—Many studies of the moon voyage have been based on simplified two-body calculations (earth and moon alone considered). But it is known that, once a rocket has moved out 4000 or more miles from the earth, both the moon *and* the sun commence to affect the flight path, and orbital calculations become very complicated.

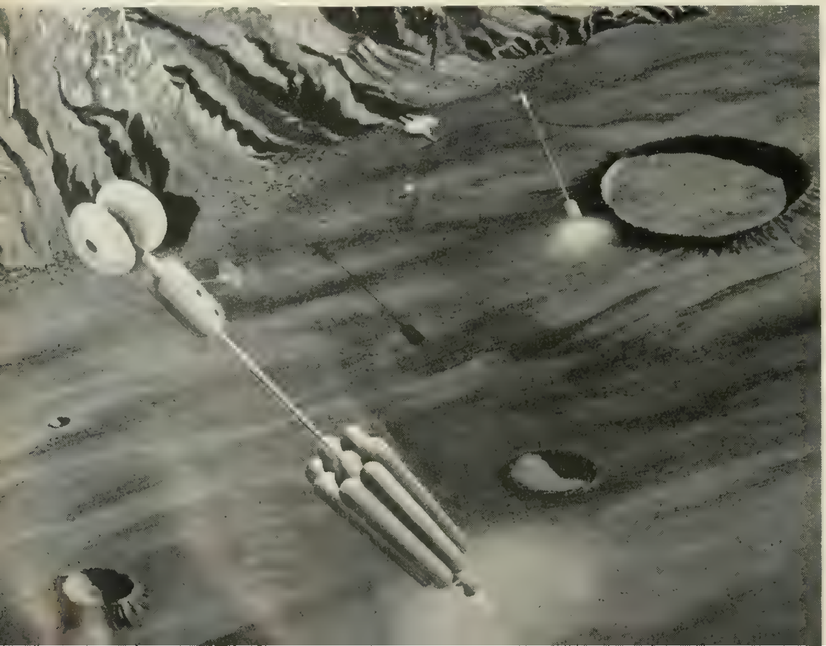
When the sun is introduced as a perturbing agent, complex three-body situations exist which may eventually have to be handled by onboard electronic computers. Internal navigation would permit orbital corrections along the flight path. Depending on initial flight conditions, the rocket would hit the moon, or circumnavigate it and return to earth space, or swing around it and escape.

An earth-moon trajectory is complex. As an example, H. Lieske shows that to hit the moon, the accuracy of the velocity vector would be 100 ft/sec. In pointing angle, one degree would be necessary. Now, if it is desired to pass very close to the lunar surface and return to the earth's atmosphere at, say 50,000 feet, it is shown that at least one foot per second value would obtain for the magnitude of the velocity vector, and up to 1/1000th of a degree in pointing angle.

Aeronutronics Systems, Inc., has recently been involved in studies of impacting on the moon. The company has conceived of a technique that would utilize a light, compact optical system in the rocket to determine its distance out from the moon in terms of the size of the moon's image. By transmitting the resulting information over a data link, scientists would in effect obtain a view of the moon approach by an optical-to-electronic picture conversion scheme.

PROBES will explore, before men set foot on Moon's surface.

Convair



In preparing for the lunar voyage, the flight program will consist of three elements: the powered phase, coasting (unpowered) and landing. *Far Side*, *Explorer*, and *Sputnik* tests have provided useful experience for the initial phase, but as yet no significant experimental data has been accumulated on rocket landing maneuvers and what would be involved in them.

• **Moon satellite**—Earlier we mentioned the possibility of establishing a satellite around the moon. Rand Corp.'s R. W. Buchheim and others have treated the problem in some detail, and it seems logical to assume at least one such vehicle will be constructed prior to attempting manned lunar flight.

Buchheim shows that a lunar satellite in an eight-hour orbit would move relative to the moon at about the same speed as the moon moves in relation to the earth—that is, at about 3360 ft/sec. Thus, if the lunar satellite had a period greater than eight hours, it would constantly move relative to the earth in the same direction as the moon. If the period were under eight hours, it would move sometimes in the moon's direction and sometimes opposite to it. At 5000 miles out, it would have a period of just 24 hours. (In making these flight-path calculations, the sun, the earth's oblateness, and other perturbing agents were neglected.)

Establishment of a lunar satellite would serve a number of purposes: as a takeoff point for the descent of an instrumented probe to the moon's surface, as a communications relay point, as a tool to determine the shape of the moon, and as "lunar-physical" research device.

Ehricke has suggested that it might be fitted to detect a possible residual lunar atmosphere. It would seem possible to prepare a lunar version of the NACA sphere experiment designed for a *Vanguard* test; such a sphere would be released and observations of its motion in orbit might reveal the existence of a tenuous atmosphere.

• **Controlled landing**—Once man is able to effect a controlled landing of an instrumented probe on the moon he will have made significant progress toward getting himself there.

Probably the first item to be landed would be suitable radio transmitting equipment. Later a variety of devices designed to study lunar characteristics would be expected, such as seismographic equipment, temperature-sensing equipment and, of course, the necessary power supplies.

In considering manned moon travel, all the space medical problems applicable to manned satellite and space flight will apply: zero gravity, cosmic radiation, acceleration, temperature, nutrition, artificial cabin atmosphere, waste removal, and, in general, the overall situation of life in a completely closed environment.

There are two general schools of thought among human factors specialists, concerning the role of man in lunar and circumlunar flight.

Some feel that the man must be alert during the entire flight, to observe, repair broken instrumentation and make any of a variety of emergency decisions.

Others would be content to leave man on the earth and allow instrumented probes to perform all the scientific observations, or at most, put the crew in a dormant state during the major portion of the voyage. They would be fed intravenously and sensing devices in the cabin would detect ambient conditions and order necessary corrections in atmospheric content, temperature, etc.

• **Man to the moon**—In a modern interceptor, armed with complex guided missiles, man is integrated into the overall guidance and control system. Often the greater part of his mission is monitored from ground-control stations, from the moment he enters into a zone of active defense or offense to the time he returns to base. His decision-making abilities are reserved only for emergencies and unusual situations.

A similar condition may prevail on early manned lunar flight, with the pilot being called upon only to make emergency decisions.

It is likely that all early navigation will be performed from astronomical observations on the earth and that corrections will be made by radio transmission.

The concept of communications between a moon rocket and the earth has received a considerable amount of study, and does not appear to offer insoluble problems.

• **AF moon rockets**—In February 1957 the Air Force Office of Scientific Research and Convair sponsored an astronautics symposium where it was emphasized that USAF already was working on a moon rocket project. Moon flight studies were reported underway at such organizations as Douglas and Convair, and the Rand Corp. continued to study the problems of circumlunar flight and moon landings for the Air Force. Convair reported that it had worked out a program to place 200 pounds of camera, television and tape recorder equipment around the moon.

Rand Corp. is concerned with tracking and communications problems as they relate to a moon vehicle. The particular vehicle under consideration would impact the moon, then telemeter data to earth stations at a relatively low rate (desirable because the things we are interested in learning about the moon's surface do not occur at rapid rates; and high transmission rates are not easily come by if low power is used). The rocket would be tracked and navigated from perhaps four stations well separated in longitude (since the earth rotates, we would want to have a number of stations so that the rocket could be viewed from at least one and preferably two at all times).

The configuration results in a rocket that would take two and one-half days to make the earth-moon voyage. The tracking parameters desired for measurements desired are: range; range-rate angles; angular rates with respect to some earth reference.

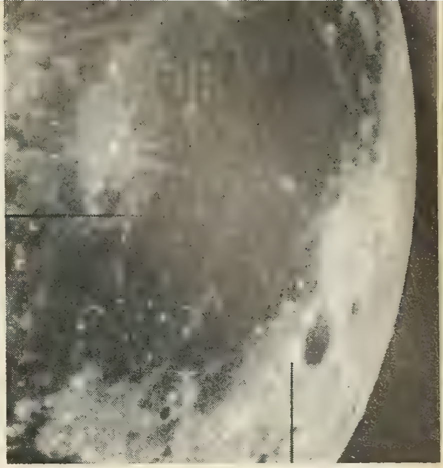
To obtain range it was suggested that a transponder beacon be used in the rocket, and rate could be obtained from the Doppler frequency shift, assuming that the beacon were sufficiently stable.

• **Two approaches**—Current proposals to place a vehicle in the vicinity of the moon are based on two philosophies: to use military off-the-shelf rockets to keep costs down and help insure reliability. Such an approach would undoubtedly speed up the moon program, and, in the earth satellite field, is exemplified by successful Army *Jupiter-C/Explorer* tests.

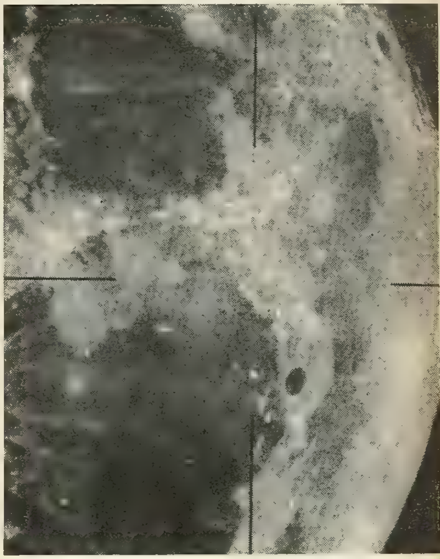
The second visualizes large ballistic rockets to boost tailormade research missiles. This is essentially the *Vanguard* approach, and while the equipment might be more sophisticated it would face the long series of delays and failures which plague any new rocket.

The Air Force Office of Scientific Research has contemplated the use of a long-burning, slow-accelerating booster rocket to minimize the problem of aerodynamic heating. Intermediate stages would then move the rocket out from the earth and the final stage, with a thrust of 50,000 pounds, would propel the vehicle into the moon's gravitational field. Booster candidates include any of the five current ballistic missiles: *Jupiter, Thor, Polaris, Atlas* and *Titan,* or the large 400,000-pound-thrust *Navaho* rocket engine. Aeronutronics has also proposed the use of existing off-the-shelf hardware based on *Far Side* but which would be in five stages as follows: cluster of four *Sergeants,* single *Sergeant,* cluster of three solid rockets (of type used in third stage of *Vanguard*), *Vanguard* third stage, and one scale *Sergeant* for the last stage.

Other projects involve impacting a rocket on the moon, especially with regard to causing either chemical or nuclear explosions on the lunar surfaces. Dr. S. Fred Singer proposed last year that useful scientific information could be gained by exploding


Perkin-Elmer

CAMERAS on Earth can see only part of the detail . . .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EVEN on closer view, more men must know about the Moon.

...Man on Moon?—Others Have Plans

an atomic bomb on the moon and analyzing the results. Such experiments are discussed in a later section.

• **Russian moon programs**—The West has no monopoly on moon projects. Russian scientists have long been interested in the prospects of moon travel, and their literature is well filled with both general discussions of the subject and more specific studies.

M. K. Tikhonravov, nearly eight years ago, wrote on a trip utilizing a rocket weighing 1000 tons, sent off with a velocity of about 11 km/sec. It would carry two men who would circle the moon once and return to the earth. If departure from an earth satellite was assumed, the vehicle would weigh considerably less (approximately 100 tons), and would take off with a velocity of 3.5 km/sec.

Other reports of about the same period suggest that a moon rocket had already been designed, that it was to be 60 meters long, have a maximum diameter of 15 meters, weigh 1000 tons and have 20 motors building up to 350 million horsepower.

Yu. S. Khlebtsevich has laid out a rather definite program for a lunar landing. In it he points out that we must know thoroughly the environment into which man must travel; insure the safety of the crew during takeoff, flight and landing maneuvers; and make full provision for return to earth. He emphasized that more complete information must be made available on the perturbations that would be encountered during the trip and their influences on flight trajectory.

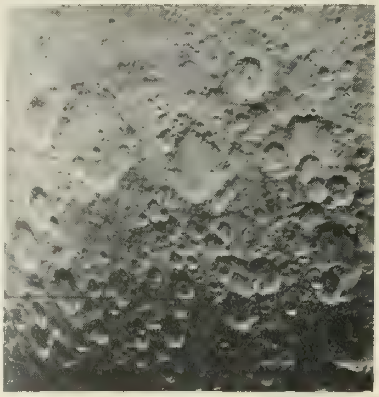
The Russians also suggested a radio-controlled, television-equipped, tank-laboratory to be set on the moon to give scientists a chance to observe the surface from close up.

Khlebtsevich assumes that man will want to stay on the moon for a considerable time and that his supplies will be delivered by radio-controlled rockets coming up from terrestrial bases. The early explorers would be in radio and televison contact with the earth and their actions would be constantly controlled by scientists and medical specialists, somewhat as was Major David Simons in the *Man-High* tests.

• **Automatic landing**—To assist in the automatic landing maneuver, the Russians suggest use of a very powerful terrestrial radar station, with a huge parabolic antenna aimed at the moon.

The following is from a translation of Rand's CASEBOOK ON SOVIET ASTRONAUTICS (RM-1760):

"Altimeters aboard the rockets receive the short impulses of this radar reflected from the moon's surface. They determine the distance between the rocket and the lunar surface by measuring the interval of time between moment of flight of the radiated impulse past the rocket and receiving the radio echo reflected from the moon. The automatic landing device aboard the rocket, utilizing the data of the lunar altimeter, at the appropriate time turns the rocket with its tail section to the moon, and, according to a special program, guides its jet engines in the regime of braking. Finally the rocket reaches the goal of its journey and lands on the lunar surface."



Perkin-Elmer

REAL CLOSE-UP views can add much to knowledge of problems.

U.S. Navy

MOON over horizon (picture is on edge) in powerful lens.

N. Varvaros, chairman of the Astronautics Section of the Chkalov Central Aero Club, said in an article on moon flight in 1955:

"The general construction scheme of a rocket for flight to the moon . . . may be approximately as follows:

"The first stage (in order of operation) must have turbojet engines; the second, ramjet engines; the third and others liquid rocket engines."

The author is assuredly conscious of the need for fuel economy, and his proposed use of turbojet engines as propulsive devices for booster stages has recently been promoted in the United States.

Last year, m/r carried a report that Prof. G. A. Chebotarev (of the USSR Academy of Sciences' Institute of Theoretical Astronomy) had suggested sending automatic rockets into lunar space. With a total flight time of about 10 days, rockets might be sent to within 3100 miles of the moon's surface.

• **Active planning**—Other sources indicate that the Russians are actively planning instrumented lunar probes equipped with television-type cameras.

At the very least it is believed they desire to establish a radio transmitter on the moon, which would send back to earth such basic measurements as surface temperature conditions.

That the Russians have made more than general studies of moon travel is evidenced by Egorov's paper entitled "Some Questions on the Dynamics of Flight to the Moon" which appeared last year. The author reports that over 600 trajectories were calculated.

Many experiments can be conducted on the moon's surface. Scientists would want to determine accurately the lunar mass, gravity, hardness and composition of the surface and interior. Seismic studies of the crust and core, temperature measurements of the surface and subsurface, and the composition of the lunar atmosphere (if one exists) would be obvious candidates for investigation.

• **Moon conditions**—It should be noted that, as on the earth, lunar gravity will vary slightly from place to place; the exact variations will be determined only after a prolonged period of exploration. As this exploration proceeds it will be possible to determine the moon's mass very accurately. This is a somewhat more difficult experiment since it will be necessary to know the average diameter, as well as the true shape, of the moon.

Some authorities have suggested that the lunar surface may be covered by a thick rather than thin layer of dust. If this proves the case, it would be a major hazard both to vehicle landings and exploration; hence it would be advisable to have precise knowledge of surface conditions. Here again, a probe vehicle, launching small explosive rockets onto the lunar surface and recording the results, would provide invaluable information to manned vehicles.

A thorough chemical analysis of the constituent parts of the lunar surface will be high on the agenda of early exploration. From studies such as this we shall learn much of the formation of the moon, and of meteorites and interplanetary matter which should be abundantly available at or near the surface.

The moon's structure will be searched for sufficiently valuable minerals which could justify their being mined and ferried to the earth.

• **H-bombs on the moon**—It is not yet known definitely whether or not the moon has a molten interior. If it should, the thickness of the outer crust would be an immediate problem. An atomic explosion on the lunar surface would produce a shock wave that would tell much about the subterranean structure. It would necessitate another instrumented probe or observation base, located at a known distance from the explosion, to validate the experiment. An atomic explosion on the moon could also be observed from the earth, and thus, by analysis of the spectral distribution of the resultant light source, we would learn of the elements present in the impact area.

A major area of contention among scientists is the presence or absence of a lunar magnetic field. Some authorities feel that the proximity of the earth to the moon almost certainly will have oriented the ferro-magnetic elements of the latter body to provide at least a weak magnetic field.

It is generally held that the moon has no atmosphere, but this may be qualified by stating that some of the heavier gases may be contained in the lunar crust, and that some atmosphere may be found in crevices and gullies.

Experimentation by probe to detect a tenuous atmosphere by spectographic means would be difficult. It is most probable that this experiment will await the advent of man on the surface, or at least will not be attempted prior to establishing lunar satellites.

Temperature variation determinations, like atmospheric calculations, may best await the landing of a manned rocket, since greatly separated distances will have to be checked to correctly map this parameter. Probes could be utilized, but so many would be involved that it would probably be economically out of the question. At present earthbound infrared and microwave radio detectors can be used to measure the radiative temperatures of the lunar surface, and of course thermocouple techniques are widely employed.

• **Moon bases**—An extremely important fact which must be determined is the impact frequency and size of meteorites. With such data, it will be simpler to construct a base of operations for major exploration. This base could also provide some protection from cosmic rays, a hazard which has not been fully determined.

Early moon explorers will almost certainly use their landing vehicle as a base of operations, but space and weight considerations will reduce the living and working space to a minimum. To avoid this cramped atmosphere, small camps will have to be established on the lunar surface. Arthur Clarke has suggested that double-walled balloons inflated to about five pounds per square inch, and anchored to the ground, would be suitable.

Space and weight requirements for such equipment (shipped aboard the exploration craft) would be low. After inflation, a hard-setting plastic could be sprayed to prevent the balloon from collapsing should a large meteorite puncture the structure. The smaller, more common type of meteorite (less than a millimeter in diameter) would produce a hole which could be easily sealed.

It would be advisable to further protect the inflated balloon base by concealing it in a cave or crevice to ensure maximum protection for the occupants. Since early expeditions will be of short duration (probably two weeks or less), a permanent base would not be considered. The basic requirements for this minimum base would be a power source, an air-conditioning unit, an atmosphere and a heating unit.

By utilizing a mirror or highly polished reflector, the sun's rays could be concentrated onto a tube containing a liquid. The liquid would be vaporized and the resultant steam would drive a turbine, to produce the desired power. A sun-follower would be needed to continually orient the mirror.

It should be noted that two weeks of sunshine will be available before lunar nightfall.

MOON COMPARED TO OTHER SATELLITES OF THE SOLAR SYSTEM

Satellite	Average Distance From Center of Primary, Miles	Diameter Miles	Siderial Period d/h/m	Magnitude
		EARTH		
Moon	239,000	2,160	27/ 7/43	-12.5
		MARS		
Phobos (1)	5,800	10-12	0/ 7/40	11-12
Deimos (2)	14,600	5-10	1/ 6/20	13-12
		JUPITER		
Amalthea (5)	113,000	100-150	0/11/57	13
Io (1)	262,000	2,000-2200	1/18/28	5.5
Europa (2)	417,000	1,750-1900	3/13/14	6.1
Ganymede (3)	665,000	3,000-3300	7/ 3/43	5.1
Callisto (4)	1,170,000	2,900-3200	16/16/32	6.3
6	7,120,000	100	250/15/0	13.7
7	7,290,000	30	260/ 1/25	17.5
10	7,200,000	20	260/12/0	18.8
12 (retrograde)	~13,000,000	14	625/ 0/0 ?	18.9
11 (retrograde)	14,000,000	18	692/12/0	18.0
8 (retrograde	14,600,000	30	739/ 0/0	16.5
9 (retrograde)	14,700,000	15	750/ 0/0	18.0
		SATURN		
Mimas (7)	113,000	300-350	0/22/37	12.1
Enceladus (6)	148,000	350-450	1/ 8/53	11.7
Tethys (5)	183,000	700-800	1/21/18	10.5
Dionne (4)	235,000	700-1000	2/17/41	10.7
Rhea (2)	328,000	1000-1150	4/12/25	10.0
Titan (1)	760,000	3000-3500	15/22/41	8.3
Hyperion (8)	923,000	200-300	21/ 6/38	13-14
Japetus (3)	2,215,000	1000-1500	79/ 7/56	11
Phoebe (9) (retrograde)	8,050,000	150	550/10/50	14-14.5
		URANUS		
Miranda (5)	75,000	200	1/ 9/56	17
Ariel (3)	119,000	500-1000 ?	2/12/29	15
Umbriel (4)	166,000	300- 700	4/ 3/28	15-17
Titania (1)	272,000	800-1200	8/16/56	14
Oberon (2)	364,000	600-1000	13/11/15	14
		NEPTUNE		
Triton (1)	220,000	2500-3100	5/21/3	13
Nereid (2)	3,500,000	200	359/ 0/0	19

• **Permanent base**—In time, a permanent lunar base will be established. The advantages of establishing such a base, from the scientific or military viewpoint, are as manifold as the difficulties associated with such a project.

The equipment and machinery payload of these freight rockets will all be specially designed for this single application. Special machinery would include rock drills, tractors and trucks.

Construction materials would have to be quarried and butt-joined together as accurately as possible since concrete could not be used in the form we now know it.

• **Moon colonies**—Eventually the moon may be colonized by several nations. Territorial possession will almost certainly be based on establishment of permanently manned bases, since no one is likely to be impressed by claims resulting from short-lived expeditions.

One of the more critical problems will be that of supplying food to the residents. Hydroponic gardening has been suggested.

It may be that in the distant future small cities will be constructed, completely enclosed by a structure permitting a reasonable facsimile of earth conditions to prevail. This would be a mammoth undertaking, but today's progress in all phases of the overall problem may well herald the laying of a lunar city's cornerstone within 25 years.★

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Selling Space Ships

by Seabrook Hull

IF YOU THINK selling missiles is baffling, try space ships. If you think missiles are expensive, try spaceships. If you think missiles present the toughest engineering problems, try spaceships. And if you think missiles have a future, try spaceships. There is not and never has been anything quite like them.

The market for tomorrow is small now, relative to that for missiles, but it will grow and grow until it becomes bigger than any military market heretofore seen in history. Russia will guarantee it. If you want in, now is the time to begin your sales campaign.

As missile buyers and missile makers alike once tended to lump manned aircraft and rocket-powered missiles in the same general technological category, they now look at the spaceship merely as an extension of the missile. Not only is this fallacious, but it can get all of us in a lot of serious trouble. The businessman that uses it will have trouble getting contracts, and those he gets will cost him and the taxpayer undue time and money. The military service that uses it will find itself with an operational requirement, but no operational hardware. And the country that uses it is liable to awaken one day to find that another country—namely Russia—got there "firstest with the mostest."

The space ship business is now largely in the feasibility study stage. Except for jury-rigged-but-effective devices using available military missiles, such as Army's *Jupiter-C*, there are no original space-flight projects in even the initial prototype assembly stage.

Whoever goes out into the market place now to sell spaceships had better be prepared to sell ideas and concepts first, rather than hardware. The first step is to convince your customer that space flight in any form really is feasible. He may be willing to spend a little money to be convinced—say, the cost of a feasibility study contract. But he's most unlikely to commit tens or hundreds of millions of dollars for hardware just on your enthusiasm and say-so.

Selling ideas is pretty much the same kind of marketing problem as selling products, though perhaps a little tougher because you don't have something solid to show your customer—something he can see and handle. But just as a piece of hardware must be mechanically convincing, so must an idea be fully supported with technical data, background experience, unassailable logic, etc.

The first thing to do in selling spaceships is to survey your market. Note who has the money; if possible, how much. Find out what's wanted, and establish an order of priority for various projects under consideration. If you're after a prime contract, investigate the three military services. If you're willing to take a subsystems contract, find out who's dickering for a prime contract and go to it. Maybe you're in a position to join forces with other companies with complementary capabilities to present a comprehensive proposal.

The group method of systems contracting has been given official approval by the Air Force and is probably acceptable to the other services as well. One company must assume the systems responsibility. This entails concept and coordination.

Once you've surveyed your market, check requirements against your (or the group's) capabilities. In the beginning, great assembly lines of production equipment are no asset. For a study contract you need a research and development staff, i.e., you need brains.

Once you've decided just how you may fit into the picture, find out who's doing what—now. For example, currently the U.S. Air Force is holding a series of meetings with a target of placing a study contract during May for a "Global Surveillance System." If you've got an idea for such a system, you should be present. But you are present by invitation only. So, get invited. This may be primarily a public relations job.

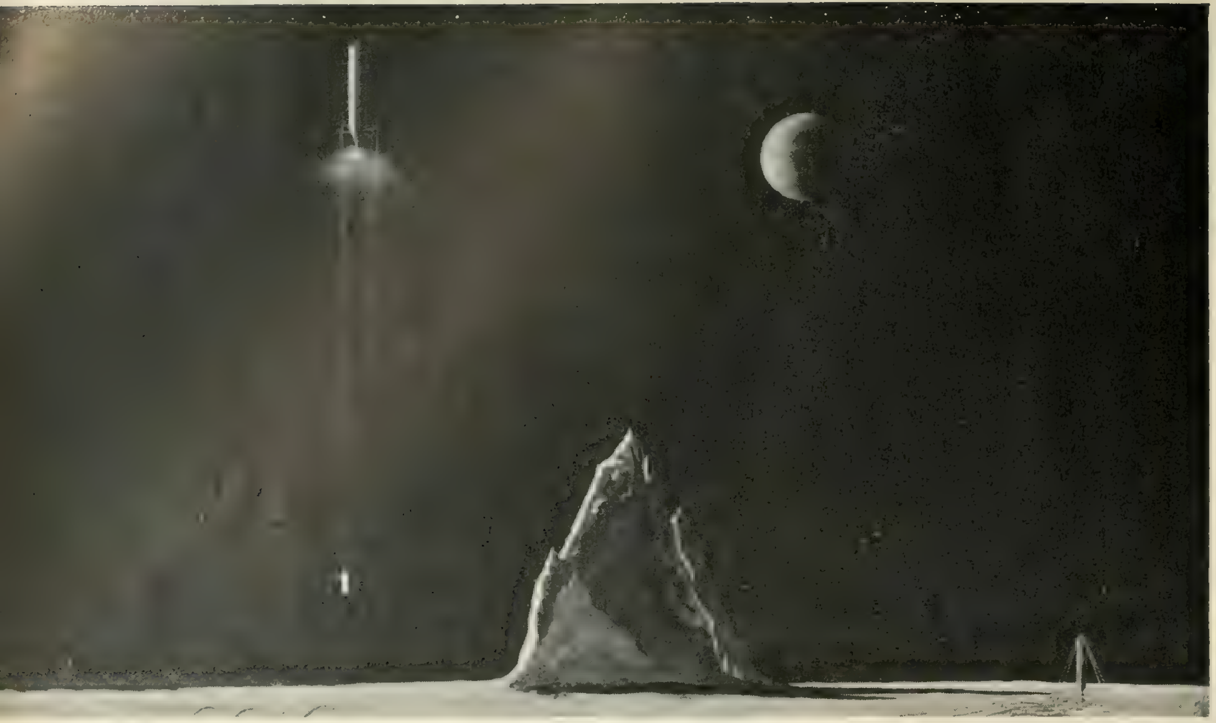
Itokawa

But once invited, have your ducks all in a row before attending. Remember, your customer has called on you for ideas—your ideas. He probably won't have much to offer, except by way of questions that aim at poking holes in your proposal. Have a complete package—the basic concept clearly presented; the arguments and supporting evidence methodically arranged; proof of your capability.

One thing that frightens your customer about space flight is its apparent staggering cost. Think your proposal through. Let ideas, creative engineering or what-have-you substitute for dollars. In other words, if your proposal is technologically and operationally equivalent to another, but yours is cheaper, you'll get the contract.

Another thing to keep in mind is that space flight is an entirely new realm. It is susceptible to entirely new approaches. In seeking your "ideas," start with the basic problem—say, to place man operationally in space for a period of three days. This would be a requirement. Get rockets, airplanes and everything else out of your mind. Revert to basic technologies. Apply them to the problem without prejudice of prior convention. Take an original approach.

To really gain a proper knowledge of your market's requirements, you should survey it yourself. Check these areas: getting man into space; keeping him there; getting him back; giving him tools to work with in space; giving him weapons (bombs and rockets are most impractical); landing him on the moon; new propulsion systems; materials in a new environment.



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Problems in Space Navigation

Complex mathematics, design of vehicle involved in solution

by Louis G. Walters*

MOST OF THE INFORMATION regarding the external physical environment of the earth has been derived from radiation passing through the atmosphere

The benefits to mankind from the extension of knowledge of the universe can be foreseen only in a vague way, but there is little doubt that there is much to be learned, and that this knowledge will have a profound effect. Examples from the past are numerous; the most obvious being the slow development of knowledge of the nucleus of the atom, partly obtained from astronomical observations, which culminated so spectacularly in the energy of fission and fusion, after the means of exploring the nucleus were available.

Only recently have advances in the arts of propulsion and guidance made serious consideration of space exploration possible. Beyond the earth satellite, the orderly development of our knowledge of the solar system (and political considerations as well) leads to the moon as the logical second step into space.

- **Easy target**—Viewed as a target, the moon does not pose a difficult aiming problem. It is relatively large, subtending an angle of nearly one-half degree from the earth.

Its mass, 1.23 percent that of its parent, contributes to a larger apparent capture diameter through gravitational means. This apparent enlargement is most pronounced for low-approach velocities and can enlarge the capture diameter by a factor of 3 for fairly low-energy trajectories.

It travels in a slightly eccentric orbit, the plane of which is inclined to the ecliptic by 5°. Its perigee and apogee distances are 22,463 and 252,710 miles respectively, reflecting an average eccentricity of 0.055.

The period of rotation, or true month, is 27.32 days, leading to an average angular rate of rotation about the earth of about one-quarter radian per day.

The lunar orbit intersects the ecliptic at two nodes; regression of these nodes in a westward direction along the ecliptic has a period of 18.6 years.

These characteristics of the moon are useful in feasibility or "design" studies of the translunar trajectory wherein basic vehicle performance and trajectory error sensitivities may be assessed.

On the other hand, data required for precise navigation to the moon must be derived from astronomical sources such as the NAUTICAL ALMANAC, due to rapid changes which occur in the moon's orbit. These considerable month-to-month variations in the apparent lunar course are due principally to the influence of the sun.

**Aeronautic Systems, Inc., Los Angeles*

• **Design and/or navigation**—Note that a distinction between design and navigation studies has been made.

In the design, a simplified model of the earth-moon system is adapted. This leads to good engineering estimates of the rocket components' required performance.

These same studies, however, do not provide a basis for formulating firing tables, since they ignore many important perturbing influences on the translunar trajectory: they provide the basis for overall vehicle design, but cannot identify the location, time and direction of launch required to achieve lunar impact in practice.

But navigation studies require consideration of all factors that serve to determine the course of the vehicle relative to that of the moon, and the use of mathematical techniques which will lead to a precise end point.

Another contrast is the relative emphasis placed on design and navigation studies. Design studies have been conducted by groups interested in lunar impact and have tended to instill a high degree of confidence in investigators.

The navigation problem, however, is far more complex and has received only superficial consideration.

• **Design studies**—Determination of the translunar trajectory involves integration of the equations describing the restricted three-body problem in an appropriate coordinate system.

For design purposes, a simple model of the earth-moon system, consisting of a planar representation of the earth and moon, with each moving in a circular path about their common center of gravity (barycenter), has been widely used. This model (Fig. 1), with the x axis linking earth and moon, demonstrates the degree of apparent distortion arising from the rotation of the coordinate system, for it would be nearly elliptic in inertial space.

Fig. 2 is typical of trajectories where the energy is relatively low. As a result, the speed of the vehicle as it approaches the moon is low as well, and the resulting capture cross section is several diameters.

This effect is clearly shown by the group of trajectories which impact the moon and which represent the influence of initial variation in path angle over a range of 1.5 percent compared with its projected diameter of .5°.

The sensitivity to launch velocity is quite considerable; for the case shown, the variation of 50 feet per second displaces neighboring trajectories by 16,000 miles as they approach the moon. Noting that the capture diameter factor of the moon is about 2.5 to these low-energy trajectories, this limits the allowable velocity error to a range of 15 feet per second. Coupled with the careful velocity control, which must be exercised by guidance equipment, is an arrival time predictable to 0.5 hour.

As the energy of the vehicle is increased, the character of the trajectory sensitivity to initial condition changes markedly. Since the approach velocity increases as well (and at a much faster rate than the launch velocity) the effective capture diameter shrinks to the actual lunar diameter and modest path-angle errors are no longer tolerable.

The intercept also takes place on a portion of the trajectory which is not strongly displaced by velocity uncertainties, and larger velocity errors are tolerable.

As the trajectory energy is increased beyond that corresponding to escape, the moon's own motion begins to play a constructive role in the guidance mission. This effect is associated with a class of trajectories which are designated "high-energy" trajectories in contrast to those that have been considered earlier.

• **Lunar motion effects**—The role lunar motion plays in the guidance mission for a high-energy trajectory is described in Fig. 2.

Several trajectories, differing only in velocity, start from a given point near the earth and proceed out along the designated paths.

The outermost trajectory corresponds to the highest launch velocity and therefor will reach lunar distance earlier than the others. Meanwhile, the moon is also moving in its orbit, and the distance which it moves in the differential arrival time of two neighbor-

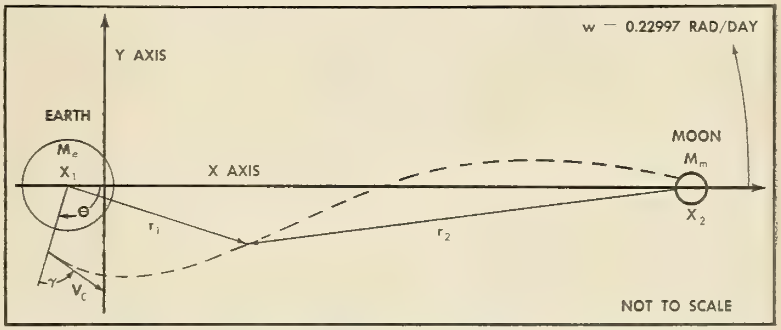

FIG. 1—Trajectory format for Earth-Moon rocket studies.

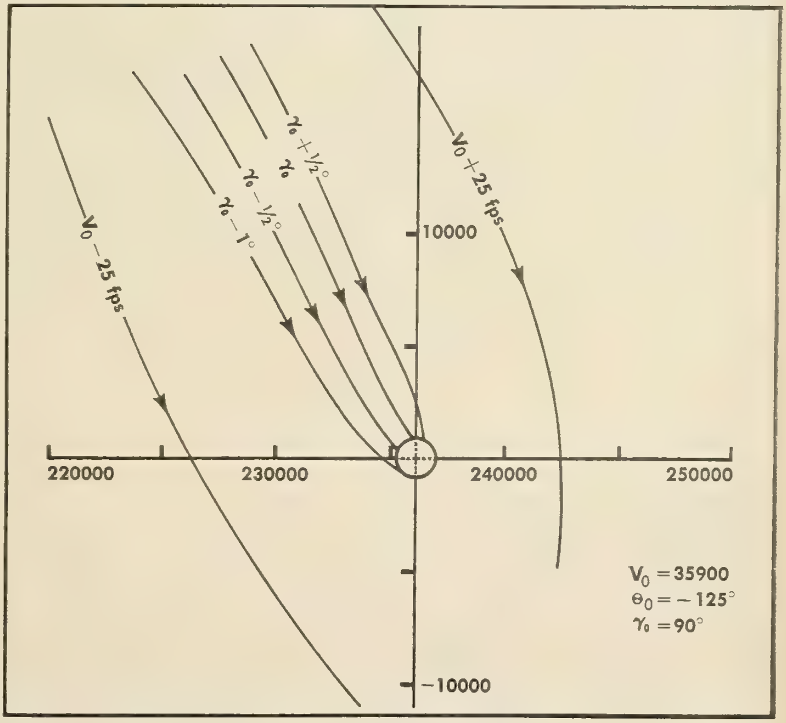

FIG. 2—Terminal trajectories for low-energy perigee launch at 100-mi. alt.

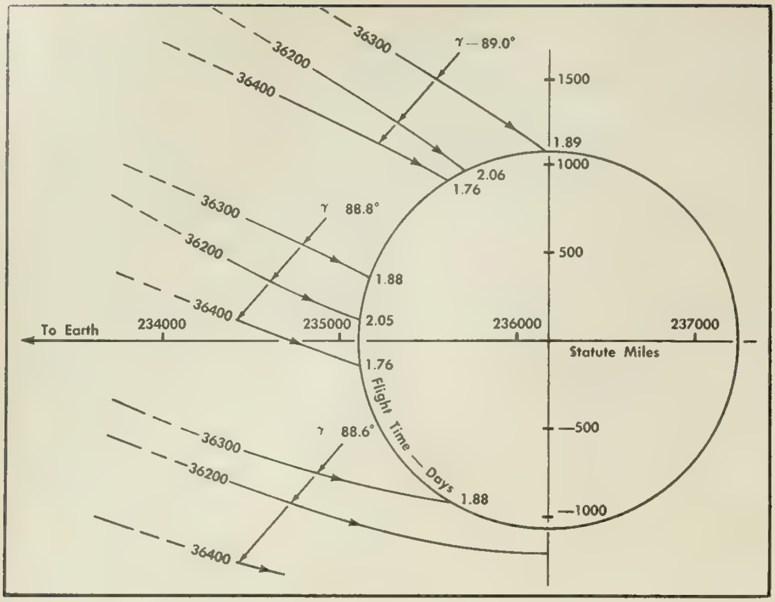

FIG. 3—Terminal trajectories for 100-mile launch: $\Theta = -$ N135°.

ing trajectories can be readily calculated.

If the differential arrival time of two neighboring trajectories can be adjusted so that the corresponding lunar displacement in its own orbit is identical to the physical displacement of the trajectories themselves, then lunar impact will occur in both cases.

The important consideration insofar as the launch is concerned is the required lead angle by which the moon initially leads the launch point. This lead angle can be computed for a Kepler orbit, ignoring the influence of the moon, and demonstrates, for velocities slightly higher than escape, a stationary value of required lead angle even as the velocity is varied over several hundred feet per second.

Thus, exact knowledge of the final velocity in this interesting situation is not required prior to launch.

A number of terminal trajectories which display this effect are given in Fig. 3. The design velocity in this case is in the neighborhood of 36,300 feet per second.

Clearly shown is the influence of variations of 100 feet per second on the impact point. As the velocity increase toward the design value, the impact point moves up the face of the moon; for higher values, the impact points then begin to retreat.

This effect can be utilized for a lunar impact mission. Careful control, of the path angle must be maintained.

This class of trajectories requires substantially more velocity than the low-energy class and, a greater expenditure of propellant is required to place payload on the moon.

The offsetting advantage is that little of this payload need be expended for guidance purposes. An additional consideration is that the arrival time at the moon will be uncertain by about three hours as in the case shown. This time uncertainty somewhat restricts the flexibility of the lunar mission in a manner which is not readily demonstrated in this two-dimensional analysis.

• **Navigational aspects**—The navigational aspect of the translunar trajectory is best visualized in terms of the projections of the orbits on a geocentric celestial sphere (Fig. 4).

The rocket is launched at the designated point and, for eastward travel from a launch point in the northern hemisphere, describes a course crossing the projection of the equator at a longitude some 90° east of the launch site.

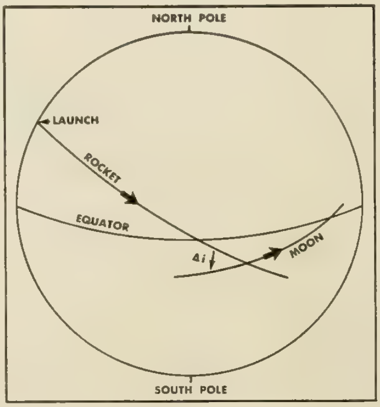

FIG. 4—Geocentric celestial sphere.

For a launch in a northerly direction, the rocket orbit would intersect the equator further east; in the case of a northward launch, this intersection would occur 180° east of the launch point. The lunar orbit, on the other hand, describes a path whose maximum declination depends on the relative orientations of the lunar orbit and of the earth's axis with the ecliptic.

The maximum inclination of the lunar orbit from the equator occurs when the ascending node coincides with the vernal equinox, and is 23.5° + 28.5°.

This situation existed in 1950 and will recur each 18.6 years as the lunar orbit plane regresses. Midway in this period, in 1959 for example, the inclination will reach only 23.5° −5° or 18.5°.

The angle of inclination between the rocket and lunar orbit planes at intercept is designated Δi. A desirable situation, assumed to exist in the design studies discussed earlier, is that these orbits are coplanar and that the problem is essentially two dimensional.

The ability to achieve this in practice depends on the latitude of the launch site and the maximum lunar declination. For a launch site located at higher latitude than the maximum lunar declination, coincidence of rocket and lunar planes is not possible.

The ideal situation involves launch from a site whose latitude corresponds to the maximum lunar declination, for under these conditions an eastward direction is required and the earth contributes the maximum velocity component due to its rotation.

From a practical point of view, a lunar mission originating from within the United States involves latitudes in excess of 28° and, as a result, the minimum relative orbit plane inclination Δi during 1958 will be 8°; this will increase to 9.5° in 1959 and will then decrease toward 0° in the late 1960s.

Fig. 5 demonstrates the azimuth heading required during 1958 from a launch latitude of 28° north as the lunar declination varies between its extremes (half lunar month) and for a typical low-energy trajectory. Also shown is the inclination angle between the orbit planes, Δi.

It is interesting to note that for launch latitudes less than 18.5°, it will always be possible to place a rocket vehicle into an orbit coplanar with that of the moon, at some time(s) during each month.

• **Uncertainty factor**—An interesting contraint on launch times is imposed by the uncertainty in flight time.

The design studies have associated arrival time uncertainties of 30 minutes and 150 minutes from design values for low- and high-energy lunar impact trajectories respectively. During this time uncertainty the moon can move an appreciable distance and, if the trajectories are not coplanar, a cross-trajectory impact error will result (Fig. 6).

For the high-energy case, the arrival time uncertainty of 150 minutes will tolerate orbital inclination of 10° without displacing the rocket more than 75 percent of the effective radius out of the lunar orbit. Under these conditions, Fig. 5 demonstrates that operations in 1958 from Florida, for example, must be confined to the period when the declination is between +5° and −15° on the southbound leg. Reference to lunar tables demonstrates an allowable launch period of five days in each lunar month for this high-energy case.

The low-energy trajectories do not suffer from large arrival-time uncertainties and, additionally, the effective lunar diameter is substantially greater. As a consequence, even the largest inclination given in Fig. 5 will not cause substantial cross-trajectory displacements.

Another important consideration is the actual computation associated with the navigation problem: this will differ in considerable detail from that used in determining vehicle design parameters, using a rotating two-dimensional coordinate system. For computations leading to actual firing data, the model must recognize these factors: (1) launch point latitude; (2) earth rotation; (3) lunar motion in declination; (4) structure of the lunar orbit; (5) perturbations of sun and equatorial bulge.

The advantages of a rotating framework vanish entirely when these are considered, and the computation must be three dimensional in any case. In addition, the reference frame for both launch point and moon are affected by precession and nutation and, consequently, are not inertial.

Another consideration is the means utilized for integrating the equations of motion. The accumulation of end-figure errors is often damaging in numerical integration, particularly where the number of steps is very large. The use of Cowell's method, for example, requires the integration of the total acceleration on the vehicle, and both the size of the terms and number of steps lead to substantial end-figure error.

Alternatively, a technique such as Encke's integrates only perturbations from a reference two-body orbit and the number of steps required is small, particularly in the critical early stages of flight.

Whatever technique is used must also provide a bound on the end-figure error so that the validity of the computational procedure may be assured.

• **Credits**—For those interested in pursuing this subject in detail, a list of references is included, which will provide foundations required for detailed studies of this problem. The author is indebted to Samuel Herrick and Robert M. L. Baker for their many constructive suggestions.★

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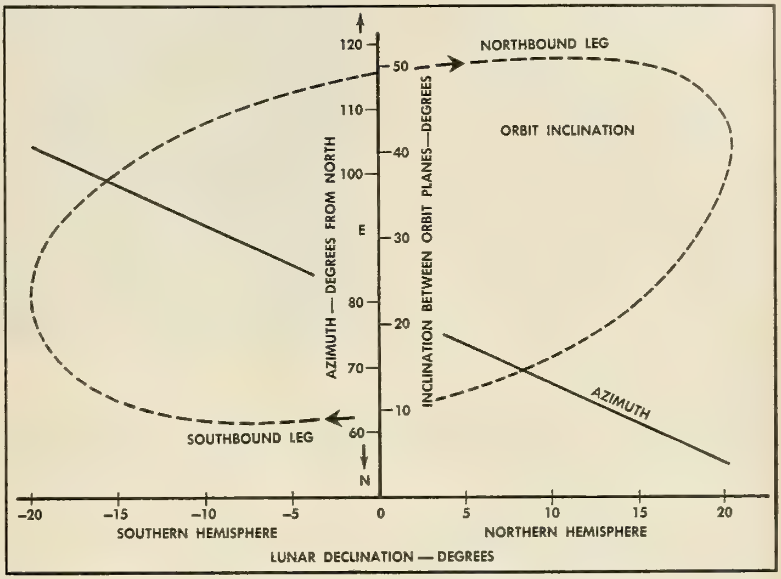


FIG. 5—Lunar trajectory conditions for current year (1958) for launch from Latitude 28° N.

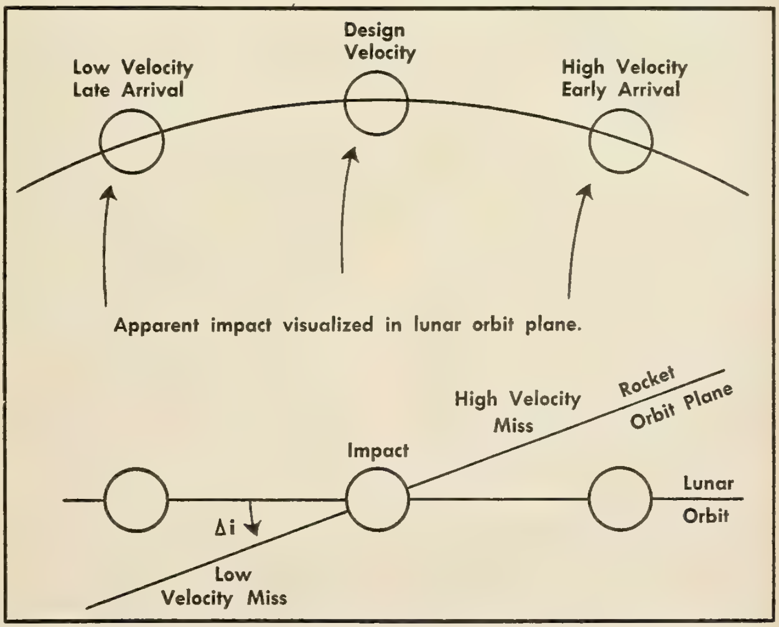
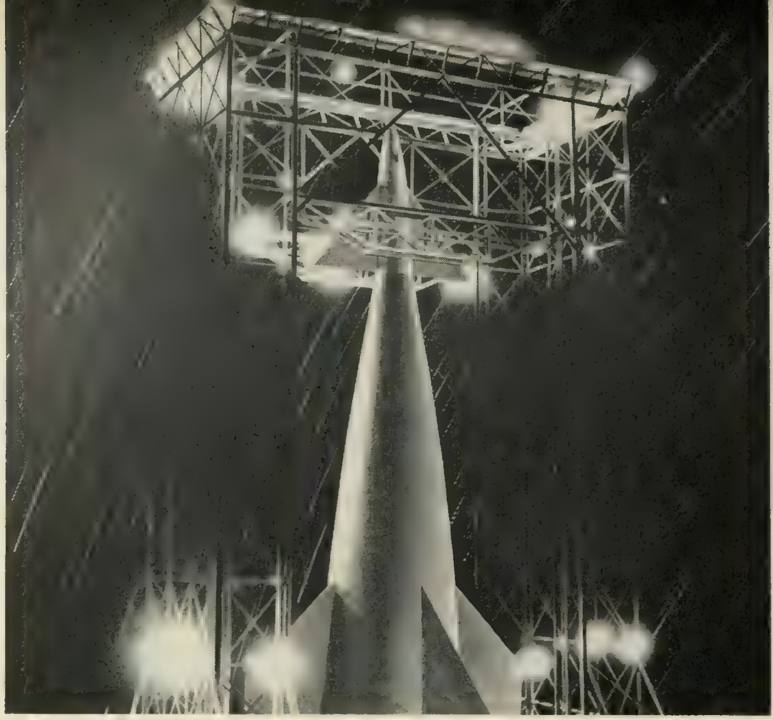

Design Velocity
Low Velocity Late Arrival
High Velocity Early Arrival
Apparent impact visualized in lunar orbit plane.
High Velocity Miss
Rocket Orbit Plane
Impact
Lunar Orbit
Δi
Low Velocity Miss

FIG. 8.—Actual miss, as viewed from Earth. Because of Moon's movement, if trajectories are not coplanar, miss can occur.

Flight into Space
must be backed
by earthbound
equipment.
That's good
reason for . . .



Itokawa

Ground Support: A Must for Space

by Robert J. Laws*

MAN'S INNATE DRIVE and curiosity will never be satisfied until every new frontier has been explored and conquered—and space is the latest and most challenging frontier to confront him. The problem of devising the equipment to conduct this exploration is a tremendous one.

• **What's ground support?**—Ground support can generally be considered to encompass all items of a system other than the flight unit itself.

Unless ground support is taken seriously now, the flights of our guided missiles will be delayed. And, if the flights of the guided missiles are delayed, or the perfection of the overall system is delayed, because development of ground support equipment was left to the very last, we will ultimately delay realization of space flight.

The guided missiles and rockets of today are the true building blocks of space flight.

Conversely, if we do keep the proper balance between development of ground support equipment and that of flight equipment—insuring that the interim step of guided missiles and rockets is accomplished by developing all of the arts and techniques simultaneously—then we will stand a far better chance of achieving space flight in the shortest time and in the most efficient manner.

• **Can't ignore it**—The usual first reaction to the ground support side of the problem is something like—"Oh, we don't have to worry about that . . . that will be solved in plenty of time . . . those are arts and techniques that we know today . . . what we need is the guided missile, and then the satellite, and then the space station and from there we can just take off and go on . . ."

The first step should be to work with the guided missile and rocket developments of today. By making integrated ground support equipment a requirement, the groundwork for development of future systems is laid. Ground support would become an art . . . and would start the development of techniques and the training of people for the future work that will be required for outer space support.

The missiles being placed in our service arsenals take on different physical characteristics as a function of desired performance. There are the small air-to-air birds, the slightly larger surface-to-air and so on to the strategic monsters in the ICBM surface-to-surface category. These different "birds" require basically different types of ground support, each according to the various factors involved; i.e., whether the bird is to be employed tactically or strategically; from fixed or mobile positions; the type of fuel, rate of fire and many other physical factors.

• **Ground handling systems**—A closer examination of just one phase of the missile ground support system—the handling complex—emphasizes that the major difficulties experienced in supplying equipment for the system begin in the manufacturer's plant. As the subassemblies become assemblies, they must be moved from operation to operation, perhaps to preliminary checkout, and ultimately packaged and loaded for shipment.

And the package must be handled in much the same manner that it will be handled by the using unit. In some instances, upon receipt it will be stored and again moved prior to unpackaging. Then might come assembly of the various components, perhaps a checkout stage or flight simulation. Next, the

---

*Baker-Raulang Co.,
Cleveland, Ohio*

components may be disassembled, repackaged, again handled and transported to lower echelons, the firing unit, or returned to the factory.

The firing unit may be anywhere from just outside the manufacturer's plant, as in the case of surface-to-air defense missiles, to any of our missile ships, or tactical and strategic air and land force installations located throughout the world. Ultimately the weapon must be loaded on the firing or launching device–which itself may range from the simplest stand or aircraft zero-length launcher to the complex, remotely controlled, trainable and elevatable launchers.

Up to this point, discussion has been limited to two of the variables which make handling of missiles slightly different from the handling of other commodities, but this is only the beginning.

What is it about the guided missile that dictates special equipment and techniques for handling? Certainly it is not the need for handling and rehandling, nor that it must be transported long distances. But the basic size and shape—in general, a long, cylindrical object with or without wings and fins—is one factor. Secondly, in many cases, this long, cylindrical object has no beam strength in itself and must be supported or cradled in some fashion at several points or through its length.

• **Shock and vibration**—As a general rule, the missiles contain electronic components or propellants which are vulnerable to excessive shock and vibration. Also, the load center, or gravity itself, changes with the various conditions of preparation. For example, a fueled missile or an unfueled missile, or a missile with a separate booster may vary the center of gravity (c.g.) location as much as 50 percent of the length of the load.

These are but a few of the factors which make this a special handling job and, of course, they are the result of the physical properties of the load itself. The problem further complicates itself when consideration is given to the operations in which the missiles will ultimately be involved. For example, there are requirements for extremely rapid handling—in the case of sustaining a given rate of fire when using the missiles as weapons. There may also be requirements for storage or protection from the elements which further complicate the handling problem. And, there is the further problem of handling long loads in confined spaces—such as aboard ships, submarines and, in some instances, aircraft.

• **Terms defined**—Still on the subject of handling the missiles, three terms should be defined in the fundamental vocabulary of the guided missile handling engineers. These are: "multipurpose, compatibility, standardization."

"Multipurpose Handling" — As mentioned earlier, the missile requires multiple handling operations in many locations and under varied conditions. The approach taken today is either the extreme of doing nothing and "making do" with jury-rigged equipment at the last minute; or designing a special piece of equipment to handle the missile under each of these sets of conditions. Multipurpose means simply that "equipment designed after considering all of the handling, situations through which a missile must pass from its fabrication to its firing, the irreducible minimum of handling devices."

For example, consider the multitude of handling operations described previously. A cradle could be designed so that it could be used as a part of the handling equipment in the manufacturer's plant, perhaps used as the assembly dolly for joining the subassemblies to form the finished product, and later used as a part of the packaging for shipment of the unit. Also, the device could be an integral part of the checkout equipment and/or the flight simulator. Perhaps, ultimately, the same device could become a part of the loading equipment for the missile.

This may be stretching the multipurpose concept just a little, but there undoubtedly is an optimum point somewhere between our position today and the concept just described. A positive effort must be made to develop multipurpose equipment and this is no small task. It requires that the technologies of shock, vibration, fueling, environment, handling and all the other facets of the problem be considered simultaneously by the ground support engineer.

"Compatibility"—There must be compatibility of a missile system within itself. The handling equipment with respect to the missile; the missile with respect to the launching device; the compatibility of the checkout equipment; the flight simulation equipment with the missile and with the launcher. This is all tied to the ultimate mission of the missile—whether it be a mail carrier, a weapon in the armed services arsenal, or a scientific research vehicle.

The need for compatibility is obvious. No one would use a ten-ton truck to carry a one-ton missile, nor provide a 50-gallon fuel trailer for servicing a missile requiring 500 gallons of fuel.

A planning program must extend further into the future than that. For equipment to be compatible, one item with another, within a system, it is necessary to set down the ultimate goal and consider every element at the moment design starts, so that each block of the pyramid fits together snugly.

"Standardization"—This term is a familiar one in the missile profession. When we speak of standardization as a fundamental requirement, we must digress from the close look at one system of space-flight equipment and group several systems into their natural families, just as the guided missiles of today group themselves into the surface-to-air or air-to-air or surface-to-surface categories.

Within a given category, then, there are undoubtedly instances where the size, weight, configuration of a weapon or the ground support requirements are similar. Knowing this to be the case, comparable systems can be laid out side-by-side, common ground found, the common items of equipment that could be used from one system to another system determined. and thus the pyramid block of "standardization" will be in sight.

Digressing again from the pure handling problem to other facets of the ground support problem, other possible fields of standardization materialize.

For example: flight checkout equipment, or flight-simulating equipment. This, of course, varies all over the lot from the "go, no-go" type test, to the elaborate laboratory test. Nevertheless, there could be common components across system lines. There are the dc amplifiers, charging units, transducers, in any given system—but have you ever heard of using a unit from one system in the other? Or something as simple as the fittings on a missile for supplying external air, or hydraulic oil or fuel?

• **Much to be done**—There is, thus, a lot that can be done about the current problem of ground support.

A project should be planned for maximum utilization of equipment, striving for compatibility and with specifications written which require standardization. This can be done for handling equipment, for servicing units, for fuel trailers and for checkout equipment and all the other items which make up the ground support equipment.

Actually this is a natural evolution that has taken place in every other program, system, or development that mankind has undertaken. All programs must and will continue to evolve, and they undoubtedly will be better for the extra time and experience devoted to them.

We are not, in general, giving ground support the attention that it deserves.★

Internal Dangers Threat in Space

by Alfred J. Zaehringer

WHENEVER manned space flight is considered, the subject most discussed is the problem of external hazards: cosmic rays, meteorites, gravity, etc. But internal hazards may be deadlier.

Two of the most obvious manned-vehicle problems are control of a synthetic atmosphere and the rocket-powerplant hazard.

Control of a suitable closed-cycle atmosphere is just now receiving attention. Improvement of rocket powerplants is now aimed at bettering reliability—especially for manned vehicles. But in any case, the pilot will be sitting on tons of usually extremely toxic chemical propellants. In addition to the chemicals, there are other contaminants—metallic poisons, and dusts.

Even in very small concentrations, exposure to propellant and chemical leakages and vapors could be very hazardous, especially for long periods.

Duration of endurance flights has been increasing, and manned rocket craft will certainly follow this trend: even the shortest manned flights may be a matter of days. For a manned satellite, the exposure time may be considerably longer. The greatest danger will come from the huge amount of chemicals that the rocket will carry. Leakage and subsequent liquid infiltration or vapor transmission into the habitable sections will cause a big problem. Even if the manned section could be completely encapsulated, there would be a secondary effect—chemical action on the capsule and possible subsequent contamination of the atmosphere.

The capsule itself will be subject to wear, which might give rise to metallic dusts. The slow decomposition products of solid propellants also could be dangerous.

Detection of all possible health hazards will have to be automatic. The human nose cannot be relied on to detect all toxic materials, since many chemicals that could be hazardous have little or no smell, or are not detectable by odor until rather high and dangerous concentrations arise. In some cases, symptoms do not show up immediately. Therefore, manned space satellites and long-travel-time vehicles will have to be equipped with detection systems.

In addition, such a "space sniffer" will have to furnish qualitative and quantitative information, and be ready to make the necessary corrections. It is likely that many of these operations will have to be relegated to the oldest detection/analysis/action system known—man himself.

Table I: Oxidizers and Monopropellants

Compound	MAC	Odor	Symptoms, Effects
Ethylene oxide	25-100 ppm		Eye irritant; kidney damages
Fluorine	1-3 mg/m^3	Pungent	Skin attack; throat, eye irritant
Fuming nitric acid	10 ppm	Acid	Eye, skin irritant; severe pulmonary damage at 200-700 ppm
Hydrogen peroxide			Mainly skin or eye irritant
Liquid oxygen		Odorless	Nontoxic; skin damage due only to cold liquid
Nitroglycerin	0.5 ppm	Ethereal	Headaches; reduced blood pressure
Nitromethane	50-200 ppm	Ethereal	Attacks nervous system, liver
Ozone	0.1-1.0 ppm	Pungent	Detectable by odor at 1 pp 500 million (skunklike); eye, throat irritant at 300 ppm; fatal in 2 hrs at 400-10,000 ppm
Tetranitromethane	0.1-0.5 ppm	Ethereal	Very toxic; eyes, lungs, liver damage; fatal in 10 min at 10 ppm

MAC: maximum allowable concentration PPM: parts per million

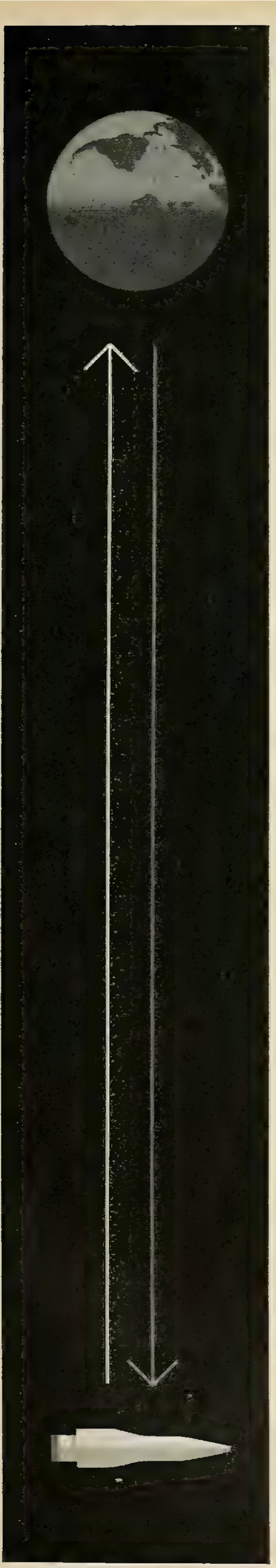
Table II: Fuels and Chemicals

Compound	MAC	Odor	Symptoms, Effects
Aniline	5 ppm	Oil-ammonia	Absorbed through skin; eye irritant; 100-150 ppm exposure for 1 hr w/o serious effects
Ammonia (Anhydrous)	100 ppm	Pungent	Eye, skin, throat irritant; detectable odor 53 ppm; 300 ppm, maximum tolerable for several hrs
Carbondioxide	5000 ppm	Odorless	Increased breathing rate, paralysis of respiratory center; 120,000-150,000 ppm causes rapid unconsciousness; death after several hrs at 250,000 ppm
Carbon-monoxide	100 ppm	Odorless	200 ppm, headaches in 2-3 hrs; 1600 ppm, nausea in 20 min; unconsciousness, death in 10-15 min at 6400 ppm
Diborane	2 ppm		Threshold limit, 0.1 ppm; 2 ppm, pulmonary damage; lethal dose, 50 ppm for 4 hrs
Ethanol	1000 ppm	Alcohol	Eye, lung irritations; intoxication
Furfuryl		Almondlike	Central nervous system attack
Gasoline	500-1000 ppm	Petroleum	Asphixiant
Hydrazine	5 ppm	Ammonia	Delayed severe irritant; burns, lung, liver, kidney damage.
Hydrogen		Odorless	Nontoxic; fire-hazard
Methanol	200 ppm	Alcohol	Central nervous system, optic nerve attack; blindness
JP	1000 ppm	Petroleum	Intoxication; headache; nausea
Pentaborane	3.3 ppm		Detectable odor, 10 ppm; lethal dose, 18 ppm

Table III: Metals

Metal	Concentration (per cubic meter)		
Beryllium	0.01-2	micrograms	mac
Lead	15	mg	tl
Magnesium	15	mg	mac
Manganese	0.15	mg	tl
Mercury	0.1	mg	tl
Molybdenum	5	mg	tl
Titanium (as Ti0^2)	15	mg	tl
Vanadium	5	mg	tl
Zinc	0.15-0.5	mg	tl
Zirconium	5-15	mg	tl

mac: maximum allowable concentration mg: milligrams tl: threshold limit



STATISTICAL COMMUNICATION TECHNIQUES and SPACE TECHNOLOGY

The transmission of information to the earth from a ballistic missile or a space vehicle presents unusual problems in communications. With severe limitations on equipment size and power, the communication system must operate in the presence of receiver noise and interference from the radio environment, including terrestrial sources and, for longer ranges, sources in space. Statistical communication techniques are valuable tools in achieving reliable communications under these difficult conditions. These techniques, by providing means for coding and decoding information and for determining the amount of information which can be sent, make possible the use of low-strength signals which otherwise could not be sorted out from the background of interference and noise.

The statistical approach is also important in the development of systems with a high degree of immunity to electronic countermeasures. The less regular or predictable the nature of transmitted waveforms, the less likelihood there is that interference will prove effective against the communication system. However, it is necessary to design the system to take maximum advantage of the near-random waveform characteristics.

Future space vehicles inherently will impose greater demands on communication systems. Systems for guidance, tracking, and data transmission through space to the moon or the nearer planets are now real goals in space technology. In the development of such systems, statistical communication techniques can be expected to play a significant role.

At Space Technology Laboratories, both experimental and analytical work are proceeding in the application of statistical techniques to the problems of space vehicle electronics. This work illustrates the advanced research and development activities in STL's Electronics Laboratory and the emphasis upon the application of new techniques to the requirements of space technology.

Both in support of its over-all systems engineering responsibility for the Air Force Ballistic Missile programs, and in anticipation of future system requirements, STL is engaged in a wide variety of research and experimental effort. Projects are in progress in aerodynamics, propulsion, structures, and electronics.

The scope of activity at Space Technology Laboratories requires a staff of unusual technical breadth and competence. Inquiries regarding the many opportunities on the Technical Staff are invited.

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Toxicity of High-Energy Fuels Poses Hazards for Handlers

by William H. Schecter*

THE HIGH-ENERGY fuels now being developed for use in missiles and manned aircraft were dramatically emphasized when the Army announced utilization of such fuels to provide additional thrust for the *Jupiter* C vehicle during launching of the *Explorer* satellite.

But the new fuels have an obvious disadvantage: they are toxic, and their combustion products are far from ideal. There is ample evidence that using such fuels for manned craft will present unusual problems for the designer. High-energy fuels are regarded as those with heating values much above those of hydrocarbon fuels. (The most important property of a fuel is the heating value, referred to as btu/lb. For example, boron-based fuels have approximately 7000 more btu's/lb than JP-4.)

• **Which is best?**—A review of the possible types of high-energy chemicals shows that hydrogen, beryllium, lithium and boron compounds are the only ones likely to produce energies significantly superior to hydrocarbon fuels.

Molecular hydrogen could readily be produced, but, since it is normally gaseous, very low temperatures would be required to store it as a liquid and even then the density is too low.

Beryllium is a more likely prospect but it is scarce, extremely and insidiously toxic, and should probably be conserved in the long run for atomic energy applications. Lithium, a similar case except for toxicity, may find use in rocketry, but in conventional aircraft it seems both difficult and extravagant.

Thus, boron is the logical element on which to base fuels. It is available in large, concentrated deposits in the United States and has chemical properties which appear desirable from the chemical-processing point of view. Fortunately, it forms more or less stable liquid compounds with hydrogen, the best chemical fuel.

Modification of the boron-hydrogen molecules by the addition of hydrocarbon groupings gives fuels of the desired physical and chemical properties. As a supplementary benefit the boranes generally have wider ranges of flammability than hydrocarbons and consequently will allow operation of air-breathing engines at higher altitudes.

The boron hydrides have the obvious disadvantage that they are toxic.

• **Development history**—Callery Chemical Co.'s history is important as a case study in handling of these somewhat toxic and highly flammable materials. Callery's safety record is believed to be comparable to the industry as a whole.

Mine Safety Appliances Co. became interested in the possibilities of boron chemistry in 1946 and assigned a small group of its top scientists to investigate the chemistry of some of these compounds. From this research came indications of completely new horizons in the field of chemistry, and Callery was formed as a subsidiary to continue this work.

Charged with developing a high-energy fuel, the research and development staff inaugurated a program that involved subcontracts with 23 universities and 13 private research organizations. As a result of these combined efforts HiCal, a boron-based high-energy fuel, was produced in pilot-plant quantities within four years. Production of tonnage quantities is soon to become a reality with the completion of two new plants currently under construction—one a $38-million plant for the Navy and the other a $4-million company-owned plant.

• **Toxicity research**—It is difficult to discuss the toxicity of boranes in humans, because the incidence of acute toxicity has been low, and clinical observations are negligible. But extensive studies of acute toxicity of boron

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**Vice President, Operations*
Callery Chemical Co.

compounds have been made on small animals. The mechanism of the action in the body is not known, but in view of chemical activity, as indicated by physical properties and structure, it is easy to predict that the boranes could interfere with biological processes.

The most extensive studies have been made on diborane, which is gaseous at room temperatures. The main effect of breathing this gas seems to be damage to the lungs. Its toxicity has often been compared with phosgene.

• **Exposure limitations**—Experiments have demonstrated that pulmonary damage can be noted if a test animal is exposed at a concentration of about 5 ppm for 6 hours a day, 5 days a week; when the test is run at 2 ppm, similar damage is noted in a somewhat longer time. The American Conference of Governmental Industrial Hygienists (ACGIH) has adopted a maximum allowable concentration for daily exposure of 0.1 ppm. This, however, is not a completely realistic value, since no method has yet been developed which can reliably detect that concentration. Diborane can be detected by odor only to 3 to 4 ppm.

Pentaborane, a volatile liquid; and decaborane, a solid, differ from diborane in that they attack the central nervous system rather than the pulmonary system. Decaborane has also been found to cause damage to the liver and kidneys. Symptoms of exposure to these higher boranes include loss of coordination, convulsions, weakness, tremors and hyperexcitability.

The suggestion has been made that the symptoms are of two types because of differences in chemical reactivity of the boranes. Diborane is taken into the lungs, where it reacts rapidly with moisture and can cause immediate damage. Decaborane and pentaborane react with water much more slowly than does diborane, so they concentrate in fats and liquids and have a more pronounced effect on the central nervous system.

Repeated 5-hour daily exposures to 3.3 ppm pentaborane causes death in test animals. Pentaborane and decaborane are more toxic than diborane maximum allowable concentrations (MAC's) so the MAC's have been set at 0.01 and 0.05 ppm, respectively. Although pentaborane is toxic in lower concentrations than decaborane, the rate of recovery of rats from decaborane exposure is always slower.

The median detectable concentration by odor for man is 2.5 ppm for pentaborane and 0.35 ppm for decaborane. Pentaborane is said to smell like garlic or acetylene, and decaborane has an unpleasant or foul odor. Rapid olfactory fatigue adds to the hazard of depending only on the sense of smell.

Even the little work that has been done on boron high-energy fuel components demonstrates that they have an order of toxicity between that of pentaborane and of decaborane. HiCal component A, which is a major component of HiCal and the one studied most thoroughly, attacks the pulmonary and central nervous systems similarly to decaborane and pentaborane.

A convenient method of comparing the acute toxicity of compounds is the concentration necessary to kill 50 percent of the test animals (LC_{50}).

A more realistic measure of effective toxicity of such compounds is the Hazard Index which is a function of both toxicity and vapor pressure. Using this index, decaborane and HiCal component A are no more hazardous than many common chemicals such as carbon tetrachloride, benzene and hydrazine. This, of course, is due to low vapor pressure at room temperature.

• **Detectors needed**—The detection of low concentrations of boranes has been a most serious problem as has analytical work in general in the boron field. All of the modern analytical tools have been utilized on this problem: mass spectrometry, infrared and ultraviolet spectrometry, and chromatography, as well as the techniques of radiochemistry.

In spite of all this analytical development effort there are still no commercial borane detectors on the market at present, but Mine Safety Appliances has two types of monitoring devices under development. One is a small, hand-operated device which is sensitive to pentaborane to about 0.4 ppm. This instrument is very useful in detecting leaks and rechecking a location after a spill.

The other instrument shows great promise: it measures the concentrations of boranes electrically and is expected to determine concentrations below 0.1 ppm, probably as low as 0.01 ppm.

• **Safety measures**—Callery's safety record in the last two years is comparable to the petroleum industry in frequency—and is very much lower in severity than any of the process industries. This record has shown steady improvement as personnel have gained experience and further developed engineering techniques in this new commercial field.

In general, safety results from avoiding inhalation, skin contact or ingestion of any borane material.

Laboratory investigations are usually carried out in fume hoods, where the air is changed at the rate of five to ten times a minute. The laboratories are maintained at a positive pressure with an auxiliary heater-blower which supplies warm outside air.

Because of chemical reactivity as well as toxicity, experiments are carried out in an all-glass, vacuum-lined system whenever possible. This technique was developed primarily for use in the boron-hydride field and has the added advantage of giving accurate results using only small quantities of reactants. Equipment such as dry boxes are also used to combat the reactivity of the chemicals and to protect research personnel.

Because of the reactivity of various of the fuel intermediates, all equipment, whether in the laboratory, pilot plants or production units, is carefully flushed with nitrogen prior to use in order to remove water and thus insure safe operation. In setting up engineering scale research equipment, quarter-inch steel plate is used both as protection for the operators and as a panelboard. This, in connection with a "soft" wall on one side of the steel-walled rooms, has served very well for the last several years.

In addition each one of these rooms is exhausted by its own blower, and air entering the building is tempered and used to pressurize the experimental units.

In full-scale operations, the same basic rules are followed to give safe operating conditions: the buildings are adequately ventilated and much of the construction is of the outdoor type, thus reducing toxic exposure.

• **Boron uses**—Recent intense research has created great interest in boron chemicals. As of now the largest "new" use of boron compounds is as high-energy fuels. Many of the new compounds have unique chemical properties, and it is inevitable that they will find many chemical uses.

One of the most notable commercial chemical properties of boranes is their reducing ability. Most commercial reducing agents, although rather cheap, are not particularly selective. The boranes, though, are quite selective.

Various boron compounds have had application in such diverse areas as polymerization catalysts, fuel additives, bacteriocides and fungicides, and as a welding flux. It is possible to protect the more active metals with a film of unreactive metal boride including some of these compounds. Methyl borate is a nonaqueous solvent which could improve certain reactions.

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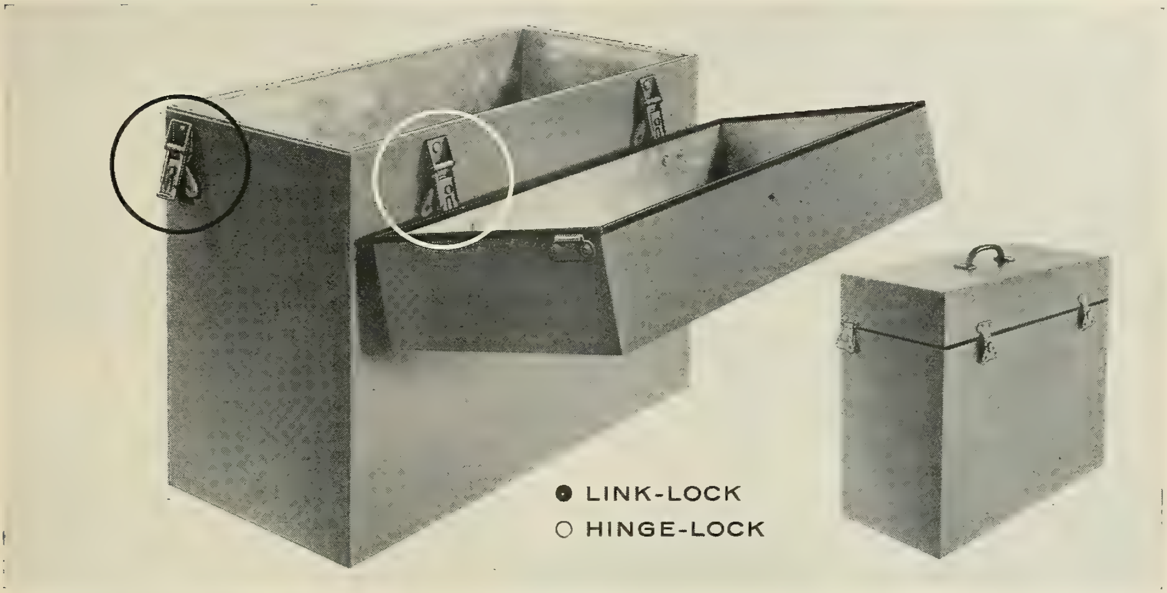

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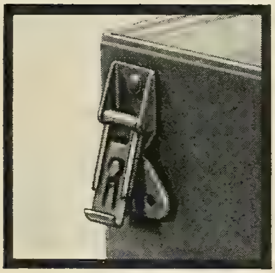

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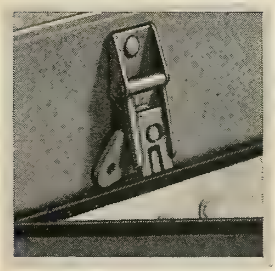

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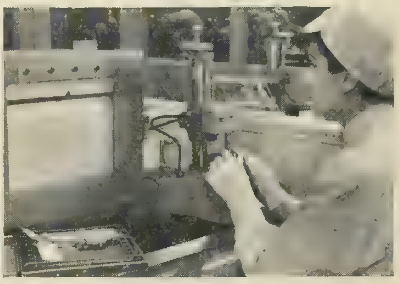

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J. Sentovic

How to Travel Outside Our Solar System

by Franco Fiorio*

IN THE ERA of ballistic missiles and satellite launching, the voice of an old master in the field of astronautical sciences reaches us from Rome, Italy, to tell of new approaches to solve the future problems of "cosmonautics."

The scientist is Prof. Gaetano Crocco, president of the Italian Rocket Society, and of the new Italian Ballistic Information Center, and father of Princeton's famed Dr. Gino Crocco. His ideas appeared in an article written in the Italian magazine, CIVILTA DELLE MACCHINE.

Prof. Crocco agrees with Dr. H. Strughold that in our solar "echosphere" there aren't many hopes of finding a suitable planet for the human race, which, under the mounting pressure of an ever-increasing population, will be forced to seek escape from the earth within a few generations.

This forecast brings about the need to know much more about both the planets of our solar system and other fixed star systems than is possible through astronomical observation tools (telescopes, spectrometers and the like).

Comparing the astronomer with Galileo and the astronaut with Columbus, Prof. Crocco points out that Galileo's theoretical findings that the earth is round, would never have been confirmed without Columbus'.

Similarly, man won't be able to plan an intelligent space travel program without a preliminary exploration by a few dedicated pioneers, who will evaluate, at close range, the possibilities of life for human on other worlds.

An important question: How far from the earth will man be able to travel and return, within the span of human life? To find an answer, Prof. Crocco has followed the same line of thought as Dr. Saenger, Dr. Ackeret and Dr. E. H. Krause in seeking an application of relativistic theory to applied cosmonautics.

First of all, to be able to reach cosmic distances, man has to learn how to fly his vehicles at cosmic speeds—very close to the speed of light. This means a new propulsion system with a specific impulse of some 30-million seconds.

Compare this astonishing figure with the 300 seconds of today's best chemical propellants and with the approximately one million seconds possible from nuclear rockets.

- **Cosmic jet stream**—However, the existence of cosmic rays, a sort of "jet stream" of particles of matter coming from the unknown depths of the universe and traveling at speeds very close to that of light, opens up many new possibilities for greater speeds.

Scientists all over the world have had considerable success in reproducing these speeds in giant accelerators.

- **Space propulsion**—Chemical propellants, even with high energy fuels and free radicals, are not suited for space propulsion. They lack the necessary energy; nuclear jet propulsion is the only possibility for substained interplanetary travel.

On this subject scientists have measured the thermic jet against the ion jet. According to a theory developed in Britain by Dr. L. R. Shepherd and A. N. Cleaver, Prof. Crocco has worked out—for a specific practical speed of interplanetary travel and for standard pressures in the combustion chambers—the following relationship between temperature and voltage needed:

$$1^\circ \text{ Kelvin} \cong 5000 \text{ Volts}$$

In other words, while a temperature of 1,800,000° K. would be needed for a "practical" speed of 190 miles

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* *Dr. Fiorio is United States liaison chief for the Italian Aeronautical and Nucleonic Center, with his headquarters in Washington, D.C.*

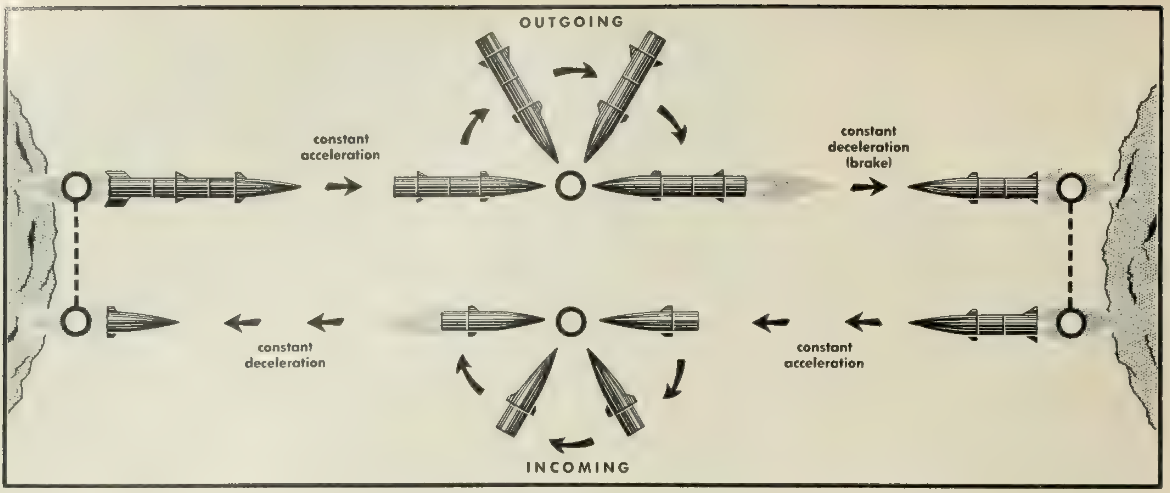

FIG. 1—FOUR STEP cosmonautic trip envisages reversal of vehicle, both on outgoing and returning trip.

per second, with a molecular weight of the jet exhaust of 2, the same result can be obtained with only 360 volts. The ion jet wins the contest easily.

An ion propulsion system might consist of an ion accelerator unit, powered by nuclear fission energy. At today's efficiency ratio of nuclear reactors, such an arrangement might reach a speed on the order of magnitude of 1/25 the speed of light.

The design and construction of a spaceship embodying these principles is perfectly feasible.

• **Not enough?**—But nuclear power at the efficiency ratio of today, with a top attainable speed of 1/25 of the speed of light—excellent for travel in our own solar system—is not good enough for travel to other solar systems or galaxies.

For this purpose Dr. Saenger visualizes photon rockets utilizing "radiation pressure" of "radiation quanta" with mass zero. Prof. Crocco disagrees with Saenger's proposal; he believes that "radiation pressure" is technically unsuited to cosmonautic propulsion due to the excessive dimensions of the radiators involved and very high operating temperatures.

He is convinced that a higher energy source is already available in matter itself—if and when human ingenuity can draw from the atom the full amount of energy available according to Einstein's equations, and convert it fully to propulsion power. It will be possible then to reach speeds quasi-equal to the speed of sound.

Both Saenger and Crocco are taking for granted that the development of either the photon rocket or the integral extraction of energy from the atom will take place.

• **Testing a cosmo-ship**—It is immediately apparent that it would be impossible to apply existing aeronautical or ballistic testing techniques to an experimental model of such a ship.

In fact, the only conventional way to test the ship close to the earth would be to curve its trajectory around our globe by a magnetic platform, using techniques similar to those in nuclear accelerators.

But the forces involved are out of the realm of practical possibilities: i.e., for a speed of 96 percent the speed of light, even ignoring the relativity effect, a force of 1300 tons would be needed for every gram of circulating matter. Adding relativity effect, this force becomes 500 tons.

This means that trajectories of bodies at relativistic speeds, are pretty much "inflexible" and cannot be deviated practically from a straight line.

The result is that for travel at relativistic speeds, only straight trajectories with the maneuvering possibilities limited to acceleration and deceleration, starts and stops can be considered.

A round trip to a target in outer space can therefore be planned either as a four or a six-step trajectory as shown in Figs. 1 and 2.

Fig. 1 shows the four-step trip: outgoing (constant accelerations and constant deceleration), and incoming (constant acceleration and constant deceleration) with inversion of the ship at the halfway point.

Fig. 2 is the six-step trip, with a constant speed phase inserted between acceleration and deceleration periods.

The speed of the cosmo-ship along the straight trajectory, up to approximately one-fifth the speed of light, can be computed by the laws of conventional astronautics:

$$B = \frac{v}{c} = \log \frac{Mo}{M} = \log R \quad (1)$$

where v is the speed of the cosmo-ship, *c* is the speed of the jet exhaust that we assumed "almost" equal to the speed of light, Mo the total mass at takeoff and M the mass at the time.

At speeds higher than one-fifth the speed of light, the conventional formula is no longer valid and Prof. Crocco presents this relativistic expression, valid in the vacuum and in the absence of gravitational forces:

$$B = \frac{v}{c} = \frac{R^2 - 1}{R^2 + 1}$$

The difference between the two regimes of speed are illustrated in Fig. 3, where it is clearly shown that how the conventional formula is no longer valid for high value of $R = \frac{Mo}{M}$ and is substituted by the relativistic expression by which the speed of the cosmo-ship increases asimtotically toward the speed of light, never reaching it: i.e., with B never reaching the value of 1.

• **Operation of the cosmo-ship**—The pilot of the cosmo-ship has what seems to be a very simple task:

If he adopts the four-steps flying plan he must accelerate the ship from zero to a maximum speed, halfway to his target. At this point he has to "reverse" the ship and start decelerating, to a stop on the chosen body.

The determination of maximum speed and of the halfway distance could be a very knotty problem—but there is a solution: if the rate of acceleration is kept equal to the rate of deceleration, (both of them kept constant by a special mass regulator)

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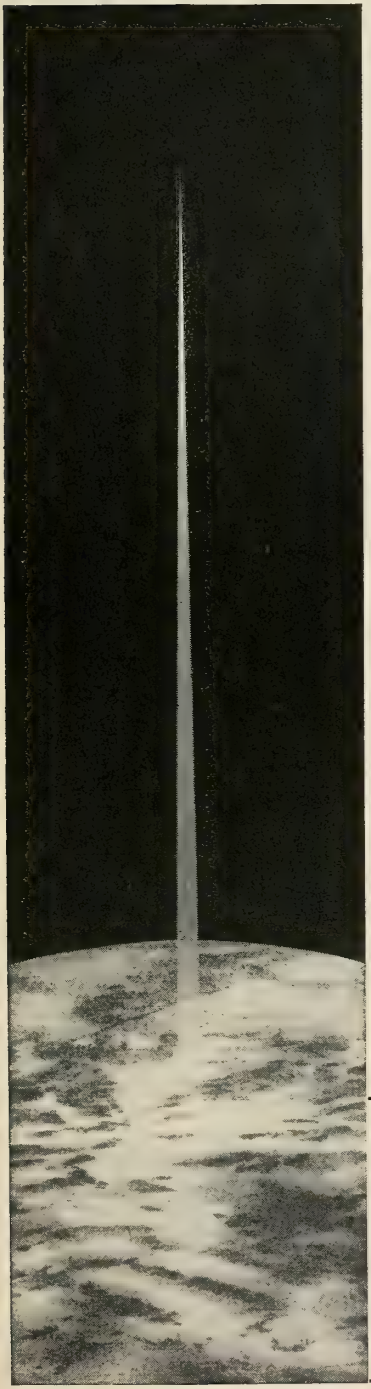

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NORMAN C. REUEL received his BS in Chem. E. at Georgia Tech. and an MSAE at Cal. Tech. specializing in jet propulsion. Following rocket and radar development in the Navy he joined North American Aviation in 1946 as a research engineer. Now assistant chief of design and development, he also finds time to relax at his ranch home, bowl, golf, and play tournament bridge.

PAUL D. CASTENHOLZ, Pacific combat veteran, graduated B.Sc. (Eng.), UCLA 1949. From research engineer his grasp of rocket engine work raised him through a supervisory post in experimental development to assistant group leader in combustion devices, and then to group leader of experimental engines. Recently completed requirements for his MSc. Relaxes with hi-fi, fishing and back packing.

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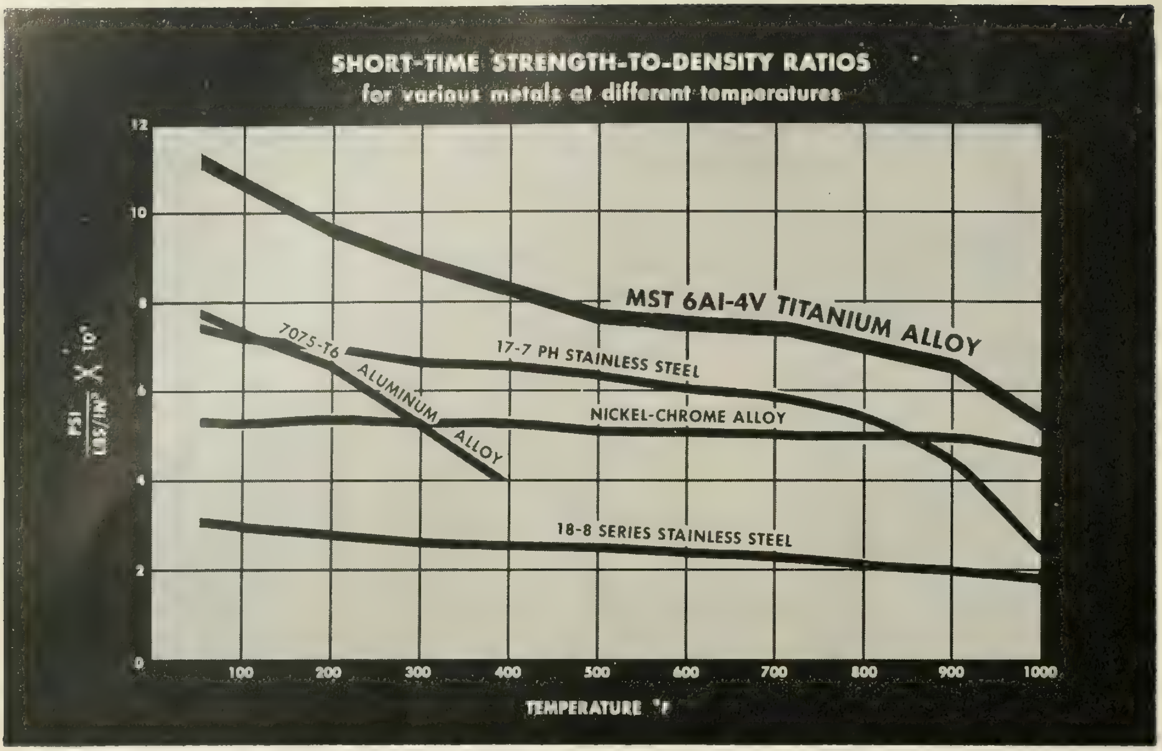

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Performance for extended times at elevated temperatures is likewise good. In typical creep tests, with 1% permanent deformation allowed, MST 6Al-4V alloy shows 100,000 psi allowable stress at 750°F for 1 hour; 77,000 psi at 100 hours; 65,000 psi at 1000 hours.

Meanwhile new alloys extending the elevated temperature usefulness of titanium—to as high as 1000°F—are now emerging from the laboratory into production.

Write Dept. C-5 for copy of "Titanium Alloy Properties"

SELECTION GUIDE TO MST ALLOYS

Typical Mechanical Properties of Annealed Titanium and its Alloys

	Form	Ultimate Tensile Strength, psi	Yield Strength, psi	Elongation %*
COMMERCIALLY PURE TITANIUM				
MST Grade III	Sheet, Bar	70,000	50,000	25
(3 different strength levels)	Sheet, Bar	85,000	65,000	23
	Sheet, Bar	100,000	80,000	20
TITANIUM ALLOYS				
MST 6Al-4V				
Annealed	Bar	140,000	130,000	15
Age hardened (1)	Bar	165,000	155,000	12
Age hardened (2)	Bar	180,000	165,000	10
Annealed	Sheet	140,000	125,000	12
MST 3Al-5Cr	Bar	155,000	145,000	13
MST 4Al-4Mn	Bar	150,000	140,000	14
MST 8 Mn	Sheet	137,000	125,000	16

(1) 1650°F—1 hour—WQ; 1100°F—2 hours—AC
(2) 1700°F—1 hour—WQ; 1000°F—8 hours—AC

WQ—Water Quench
AC—Air Cool

* Values for 1" on bar and 2" on sheet

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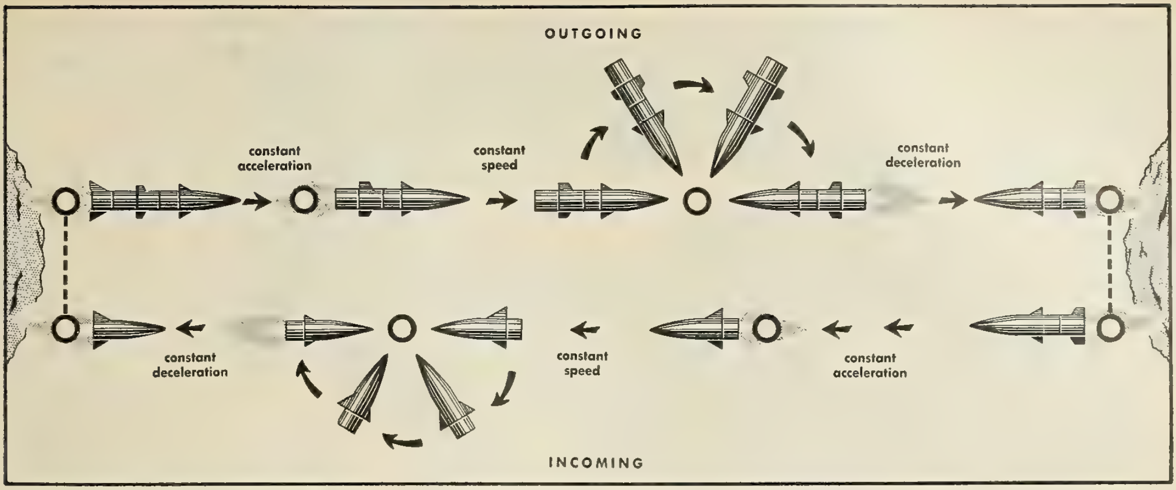


FIG. 2—SIX-STEP cosmonautic trip adds work for pilot, calls for careful reading of instrumentation.

the formula (1) and (2) supply a way to determine speed and distance through the measurement of $\frac{Mo}{M} = R$, i.e., the consumption of nuclear fuel.

Of course, the assumption is valid only for motion in a vacuum and in the absence of gravitational forces. Therefore, it applies only to cosmic travel, and not to interplanetary flight within our solar system.

Measurements taken inside the cosmo-ship will check with the ones taken on earth for only a short time: until the ship reaches one-fifth the speed of light.

If the pilot chooses a constant acceleration of 9.5 meters/sec²—very close to g—the identity between ship and earth measurements is valid only for the distance of 32 times the radius of the solar system. The pilot can thus determine the moment he reaches a relativistic speed by checking his fuel consumption, which would indicate an $R = 1.2214$, equivalent to 73 days of flight.

From then on, the pilot flies at relativistic speeds and the advantage of the relationship between speed and consumption comes into play: the pilot doesn't have to worry about relativistic time and acceleration; all he has to do is to keep a close check on constant acceleration as indicated by his ship-borne instruments and to measure his fuel consumption, to determine exactly when he has to "reverse" the ship the distance covered and the exact speed of the ship.

In the case of a constant acceleration and deceleration of 9.5 m/sec² the crew should also be in good physiological condition, since the whole trip would be made at a personal weight very close to weight on earth.

In this case, the relativistic relationship between fuel consumption and the distance n measured in light-years, according to Prof. Crocco is:

$$n = \frac{(R-1)^2}{2R}$$

Though the pilot doesn't have to worry about computation of the elapsed time doesn't mean that time has no importance for the crew. Both astronomical time—terrestrial time—and the relativistic time are important, because they affect the very life of the travelers.

As Saenger, Krause, Ackeret and many others have already pointed out, relativistic "dilation" affects the crew's time, making it shorter than terrestrial. The Crocco equations, establishing the relationship between terrestrial time T, relativistic (crew's) time Te and distance covered n (in light-years) are:

$$ATe = \log R$$

$$\frac{T}{T_e} = \frac{R^2-1}{2R \log R} \qquad n = \frac{(R-1)^2}{2R \log R}$$

where: R has the usual significance and A is a coefficient function of the ship's acceleration becoming equal-l for an acceleration of 9.5 meters/sec.² A very quick calculation shows that, for A-1, and R-10, an elapsed time of 4.5 terrestrial years is equivalent to only 2.3 years of the crew's life and is sufficient to travel a distance of 4.05 light-years.

In other words, under those particular conditions, the crew has the illusion of traveling at almost twice the speed of light.

• **Limits of Cosmonautic travel**—Two important factors in future cosmonautic travels will be the fuel consumption characteristics of the propulsion system and the physiological length of the human life.

Starting from the assumption of a cosmo-ship with a total weight/payload (including fuel) ratio of 1300, i.e., of the order of magnitude of today's artificial satellites, and accepting the "optimum" conditions outlined before (as the full exploitation of the energy of the atoms: a vehicle speed "quasi" equal to the speed of light, etc.), Prof. Crocco comes to the conclusion that, for a four-step constant acceleration round trip (Fig. 2) in space, a practical limiting distance might be 16 light-years.

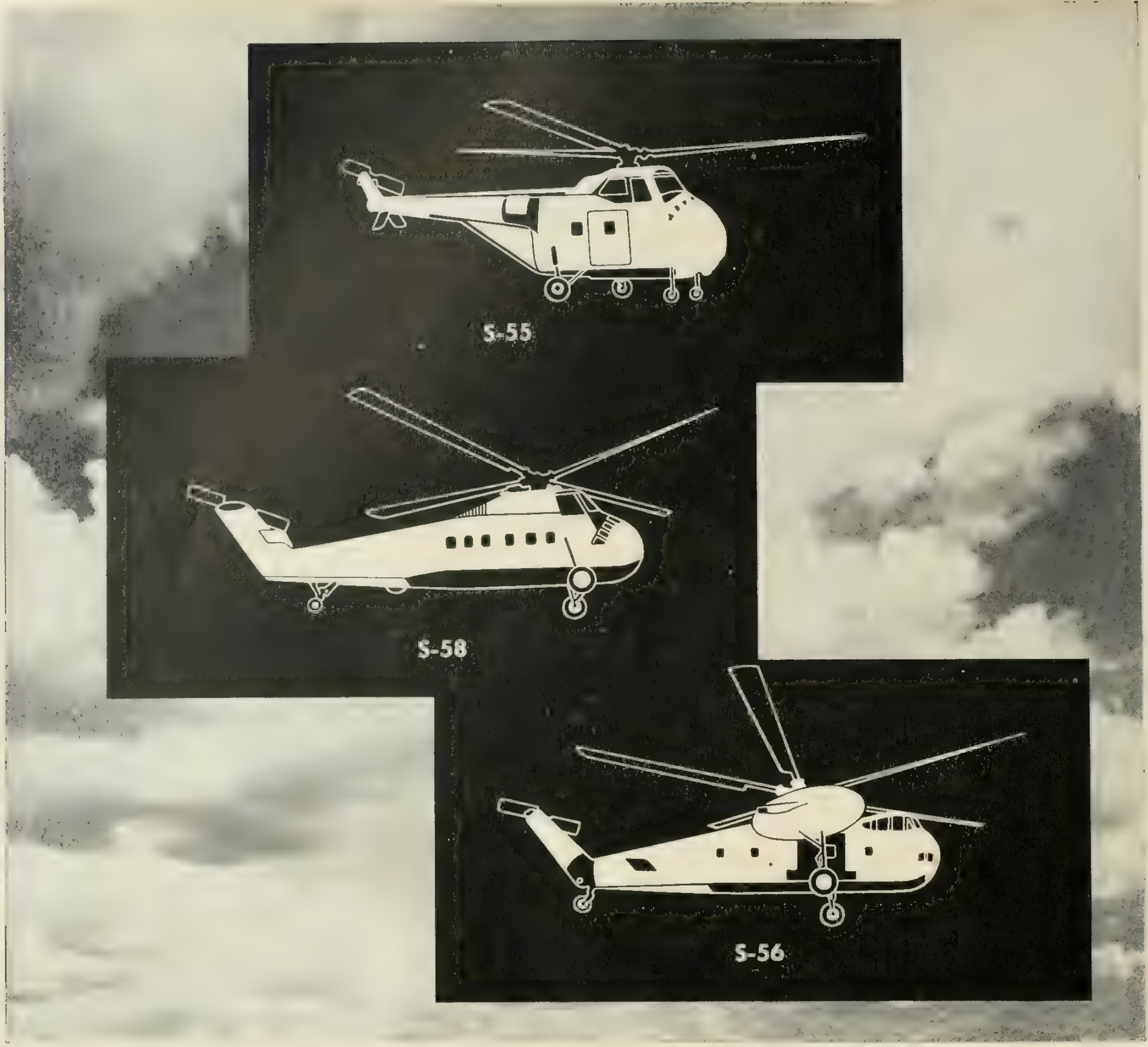
It would take almost 30 years of life for a roundtrip of that kind, which could reach the star, Altair, and approximately 50 other stars within the same radius from the earth.

If, instead of the convenient four-step, constant acceleration scheme, the more sophisticated, six-step (Fig. 2) scheme is adopted, the advantage of using only the fuel consumption as a distance and speed gauge is lost, and for the stretch traveled at constant speed, the accurate measurement of the relativity time is also mandatory.

On the other hand, for the six-step scheme Prof. Crocco is able to demonstrate that the limiting distance for equal values of Ie and R is almost double that in the four-step scheme.

It therefore would be possible to reach the distance within a sphere of a 34-light-year radius, containing approximately 480 fixed stars.

These by no means are the limits of man's ultimate frontiers in the exploration of space. Some day it will be possible to devise a way to utilize as fuel the energy of fragments of matter existing in space. In this case the frontiers of the universe could be pushed even farther away and an increasing number of new stars would fall within reach of the human race.★



white areas show extensive use of magnesium

MAGNESIUM ALLOYS BUILD BIGGER PAYLOADS INTO SIKORSKY 'COPTERS

Structural dead weight—that ever critical problem in the design of air frames and missiles—is a problem Sikorsky Aircraft solved several years ago.

As every helicopter designer well knows, everything below the rotor is sheer dead weight and contributes nothing to lifting the aircraft. So it's no wonder Sikorsky uses magnesium alloys where they can. This lightest of all structural metals weighs only 65% as much as aluminum. Easy to see how the use of magnesium adds substantially to the payload—by subtracting weight from the structural load.

The S-56, Sikorsky's largest 'copter to date, carries a total of 5,558 lbs. of magnesium. This total includes the wheels, almost the entire skin and numerous other components. Several highly stressed areas, such as the rotor hub plates, are magnesium forgings. Other Sikorsky models, such as the S-58 and S-55, famous Korean War 'copter, also use magnesium alloys to good advantage.

For more information about magnesium, contact your nearest Dow Sales Office or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Department MA 1402L.

MAGNESIUM FORM	**LBS. USED**		
	S-55	*S-58*	*S-56*
Sheet	**580**	**1303**	**2288**
Extrusions	**68**	**51**	**246**
Castings	**307**	**266**	**1466**
Forgings	**77**	**198**	**1144**
Bar and Tube	**83**	**186**	**414**
Total	**1,115**	**2,004**	**5,558**

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Recoverable Boosters Are Studied to Cut Manned Space Flight Cost

by D. C. Romick, R. A. Belfiglio and F. B. Sandgren*

WITHIN A RELATIVELY short time, manned space flight can be expected to assume large-scale proportions. In anticipation of this, the concept known as *Meteor*[1,2,3] employing manned recoverable boosters, has been analyzed and studied under sponsorship of Goodyear Aircraft Corp. (m/r, March, p. 134).

The basic assumption implicit in the idea of manned space flight is that it will be possible to obtain satisfactory re-entry and control of the final stage. *Meteor* extends the principle of reentry and control to the manned booster phases as well as to the final stage, reducing the cost of the launch to the expenditure of fuel without simultaneously destroying the expensive booster hardware.

Primary objective in the *Meteor* concept is reduction in cost of manned space-flight operations. Other benefits include freedom of selection of launch site, and choice of orbit without danger that expended boosters will fall into inappropriate areas.

Manned space flight in the immediate future will utilize existing nonrecoverable booster hardware. A practical necessity, it is economically feasible because of the comparatively few flights involved. But long-range operational requirements of manned space flight will involve continuous operation of reconnaissance patrols, communicacations relay systems, and establishment of a satellite space station for lunar and interplanetary probes.

The number of flights required for these operations will make the costs of expendable boosters prohibitive. It appears inevitable, then, that some method should be devised to recover the expensive booster stages of any space-flight system, even though added initial investments and effort will be required. The *Meteor* concept is designed to take advantage of these possible long-range economies.

- **Vehicle for recovery**—In the concept of *Meteor,* a three-stage vehicle is employed. The first and second stages—after separation—glide to auxiliary bases where they are fitted with turbojet engine pods and tail fairings, so that they can be flown back to the launching base for reuse. The final stage is also a winged glide vehicle, which on re-entry, returns to the launching base.

A variety of third-stage vehicle configurations or loadings may be employed, depending upon the mission. The final stage is big enough to be used for reconnaissance, bombing, interception, or satellite ferry missions. The same first and second stages and the auxiliary subsystems can, therefore, be utilized for all missions.

- **How many needed?**—In order to establish a basis for comparison, the magnitude of future operational uses was first determined, then an operational schedule was used to estimate the number of vehicles involved, and the cost of the operational system was calculated. This cost analysis is based on using *Meteor Jr,* a minimum-sized ferry rocket vehicle.

An aggregate of projected requirements for various possible missions have been plotted in Fig. 1, on the basis of the daily number of flights. Military demands include reconnaissance, bombardment, interception, and building and supporting a space station. Non-military demands include scientific research, meteorology, astronomy, and communication relay—all on an individual basis, with a view toward eventual establishment of a space platform for various public services and scientific functions. Such platforms can be expected to serve both military and nonmilitary missions, to support extraorbital ferry flights.

The abrupt reduction in the slopes of the upper total curve anticipates the introduction of newer models with greater carrying capacity. In general, the utilization curve of any one model resembles a normal distribution curve.

The number of vehicles required to satisfy the demands of the missions outlined depends on the number of flights each vehicle can supply. This, in turn, is determined both by the total number of flights of which the vehicle is capable, and availability by scheduling.

The total flight capability depends on the operational design life of the vehicle, the operational attrition and the operational life span in years. As for any manned aircraft, the design life of the vehicle cannot be a limiting factor. The incidence of "washout" type accidents was estimated by analysis of data on current military operations, discussions with pilots about comparative flight characteristics, and reliability studies of the takeoff phase.

Goodyear

From this analysis an attrition rate was assumed to be one per 1000 flights per vehicle. From consideration of the life span of military models, an operational life span of 100 years was assumed; this was consistent with the projected operational flight requirements shown in FIG. 2.

Schedule availability is dependent on the operational turn-around time of the vehicle system. Analytical consideration was given to the time required for each separate operation. The first stage required 29 hours; second stage 33 hours, and the final stage 29 to 49 hours, depending on the mission. From these values the average number of yearly flights per vehicle was determined to be 250.

Based on this availability, the maximum number of vehicles required at the peak demand for a particular model, plus the attrition to that date, determined the total number of vehicles required. The attrition rate does not reduce the number of vehicles required below the demand curve for the usage of a particular model as it is superseded by advanced design; the

---

* *D. C. Romick is head, astronautics section, Weapon System Department; R. A. Belfiglio is manager, Engineering Planning and Scheduling Department, and F. B. Sandgren is manager, Design Development Department, all of Goodyear Corp., Akron, Ohio.*

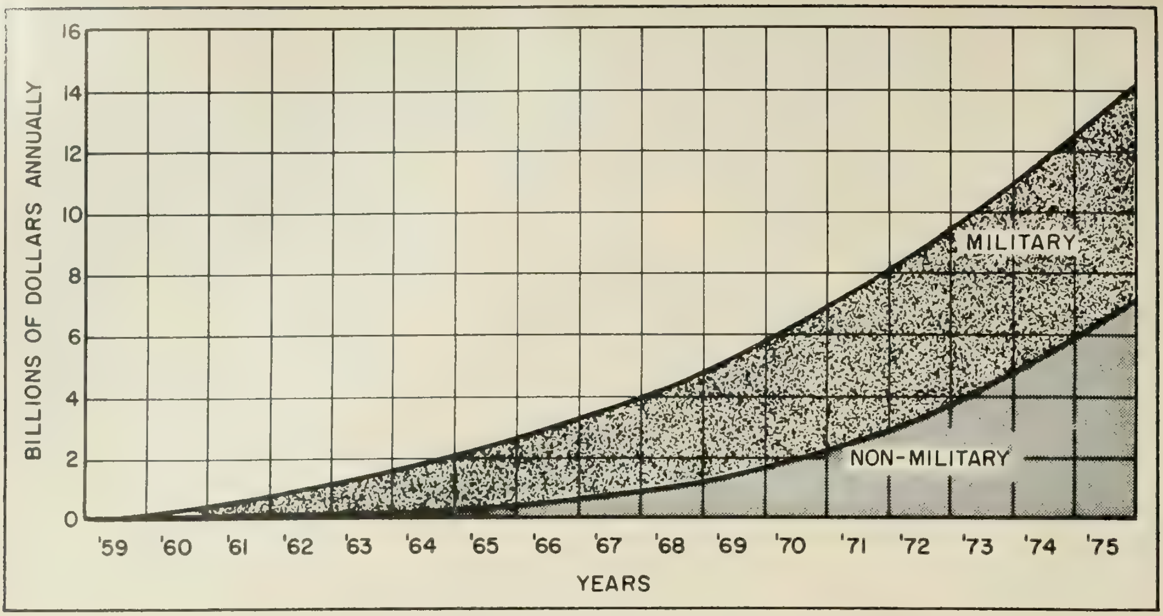


FIG. 1—Projected total costs of *Meteor Jr.*, for two probable uses.

number required at the aforementioned peak of demand, therefore, has been entered in Table 1. The longer turnaround time of the third stage resulted in doubling the requirements for this stage.

• **Figuring costs**—Having established the number of vehicles required, it was now possible to estimate the cost of the system. Cost per vehicle was obtained by application of typical bomber costs.

This technique appears reasonable; the empty weight of stage 1 is less than a B-52, the empty weight of the stage 2 vehicle is less than a B-57 or a B-45, and the overall complexity of these stages does not seem significantly greater than that of modern bombers. Progress curves were plotted for manpower, material and rocket-motor costs in order to achieve reasonable production costs. In production, *Meteor Jr* costs per pound for the booster-stage vehicles should approximate bomber production costs.

To determine overall system costs, data previously discussed was compiled to form Table 1, which represents the elements of cost involved for various mission characteristics, which are indicated by the values in the first three columns, and are similar to those used to derive the curves of Fig. 2.

For example, the fifth entry below the dashed cross-over line on Table 1

Table 1: Comparative System Operation Cost (Meteor vs. Expendable Booster)

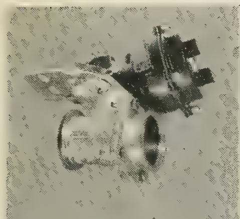
	Mission Characteristics			No. and Cost of Recoverable Vehicles					Total system		Cost flight		
Line No.*	Operating period (years)	No. of flights	Peak daily flights	Boosters I and II		Final stage		Total vehicles	Recoverable	Expendable	Recoverable	Expendable	Cost Ratio Exp./rec.
1.	1	30	⅕ to ½	1	$ 26,000	1 or 2	$ 1,460*	$ 27,460*	$ 150,000*	$ 98,460*	$5,000,000	$3,282,000	2/3
2.	2	100	½ avg- (1 every other day)	1	26,000	2	1,460	28,920	289,000	285,000	2,890,000	2,850,000	1
							Cross-	over					
3.	5½	1,000	.1	2	50,000	4	2,300	52,300	523,000	1,300,000	523,000	$1,300,000	2½
4.	8	3,000	2	5	105,000	9	3,700	108,700	1,087,000	3,900,000	362,000		3½
5.	8	5,000	3½	8	148,000	16	6,100	154,100	1,541,000	6,500,000	308,500		4
6.	4	5,000	7	14	222,000	26	8,700	230,700	2,300,700	6,500,000	461,000		3
7.	10	10,000	5½	14	222,000	27	9,000	231,000	2,310,000	13,000,000	231,000		5½
8.	10	20,000	11	27	364,000	53	14,500	378,500	3,785,000	26,000,000	189,000		7
9.	10	50,000	27½	66	704,000	133	28,000	732,000	7,320,000	65,000,000	146,000		9
10.	10	100,000	55	132	1,200,000	265	46,000	1,246,000	12,460 000	130,000,000	124,500		10
11.	6	50,000	60	140	1,250,000	280	48,000	1 298,000	12,980 000	65.000,000	260,000		5

(*000 omitted)

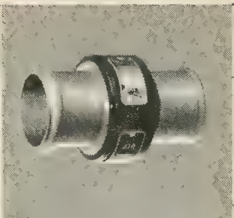
The operations as listed could serve as follows:

Line 1. Scientific missions (astronomy, space biology, electronic and chemical research, etc).
Line 2. Same, over longer period of time, expanding capability.
Line 3. Limited reconnaissance mission, as well as scientific.
Line 4. More extensive reconnaissance capability, and/or limited interception and patrol mission.
Line 5. Same as line 4, but greater capability.
Line 6. Intercept missions, or building and supplying a small satellite space station.
Line 7. Good-sized station-building mission, though at a slow expansion rate.
Line 8. Station building mission, combined with other above listed missions.
Line 9. Combined missions somewhat corresponding to those shown in Fig. 2.
Line 10. Extensive combined mission capability.
Line 11. Special high-density bombing mission capability.

Pneumatic controls


Modulating valves
244 types

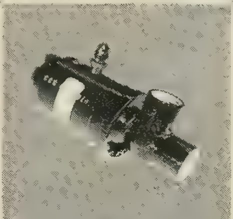
FOR


Check valves
80 types

AIRCRAFT

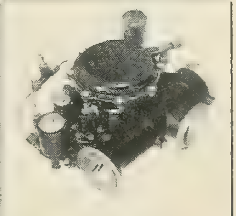
Relief pressure regulators
27 types

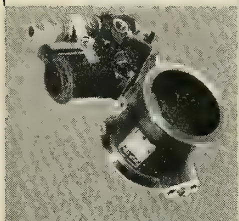
Ratio pressure regulators
16 types


Absolute pressure regulators
18 types

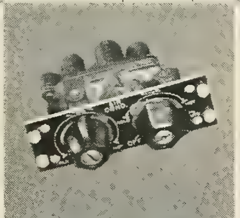
MISSILES

Thermostats
8 types


Flow regulators
28 types


Shutoff valves
349 types

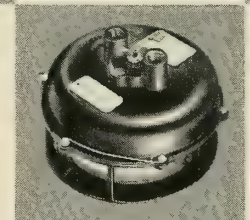
NUCLEONICS


Temperature controls
20 types

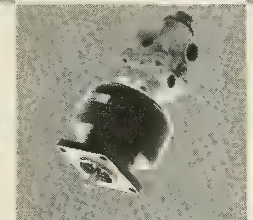
CRYOGENICS

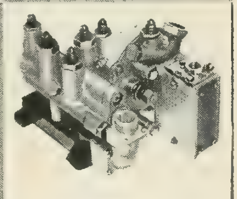
Mixing valves
25 types

Differential pressure regulators
414 types


Compartment regulators
267 types

Pneumatic switches
10 types


Pneumatic governors
50 types


Pneumatic engine computer-controllers
6 types

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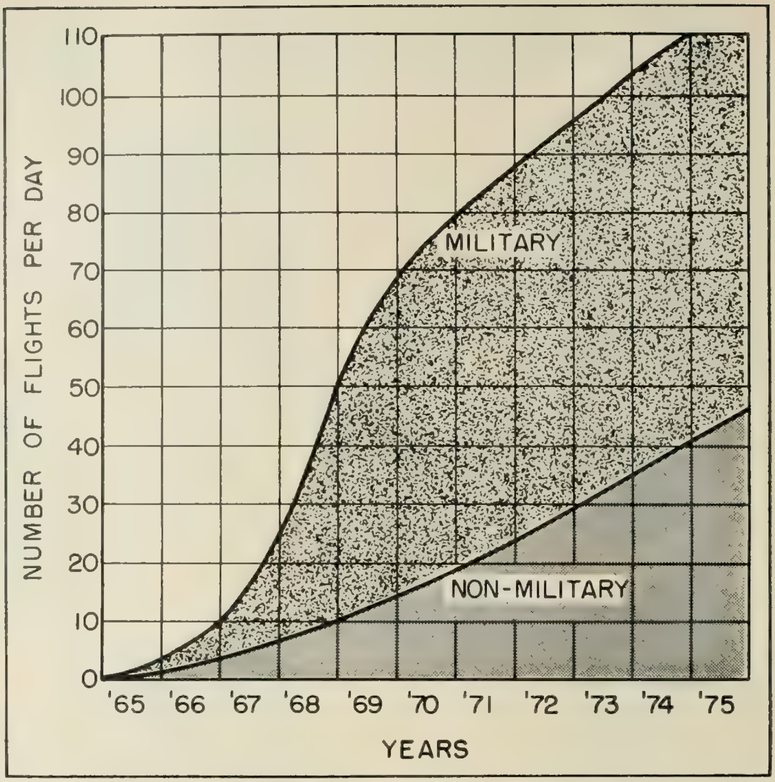

FIG. 2—Projected operational flight requirements for missile system employing with either recoverable or expendable boosters.

assumes 10,000 flights over a ten-year period with an average peak rate of 5½ flights per day.

To accomplish this, 14 pairs of recoverable booster-stage vehicles and 27 final-stage vehicles are required, costing a total of $231 million. After adding the corresponding operational costs, the total system cost using recoverable boosters is $2.31 billion. For the same number of flights, the total system cost using expendable boosters is about $13 billion. This yields an average cost of $231,000 per flight for *Meteor Jr* recoverable boosters, compared to $1.3 million per flight using expendable boosters for this size operation.

The ratio of expendable booster systems to *Meteor Jr* system cost is, therefore, about 5½ to 1, and becomes more favorable as the number of required flights increases. It appears that the cross-over point is around 100 flights. If total flight requirements are less than 100 flights, the cost ratio will probably favor the expendable boosters.

It is possible, however, that flight flexibility of the booster stages of *Meteor Jr* may facilitate development testing to a point where cost cross-over is reduced to considerably less than 100 flights. At any rate, this analysis shows that for more than 1000 total operational flights the economic superiority for the recoverable booster feature continues to increase.

From the information thus obtained it becomes possible to project corresponding total cost for a *Meteor Jr* system operation of the extent indicated in Fig. 2. This projection is presented in Fig. 1.

The projected total costs on Fig. 1 start rather modestly in the early '60s and reach a peak of $14 billion annually in 1975, when projected daily flights into orbit exceed a rate of 100 per day. The costs reflected in FIG. 1 are all overall, including development, procurement, and operational and maintenance costs.

This program appears economically feasible if compared with long-range predictions in our Gross National Product (GNP), National Budget, and Defense Department budget. The division of costs between military and nonmilitary agencies could have a "checks and balances" effect upon integrated program activities and tend to hold costs to within reasonable proportions.

The above analysis shows that, while such orbital operations will be expensive (as have all new systems of higher performance), they need not

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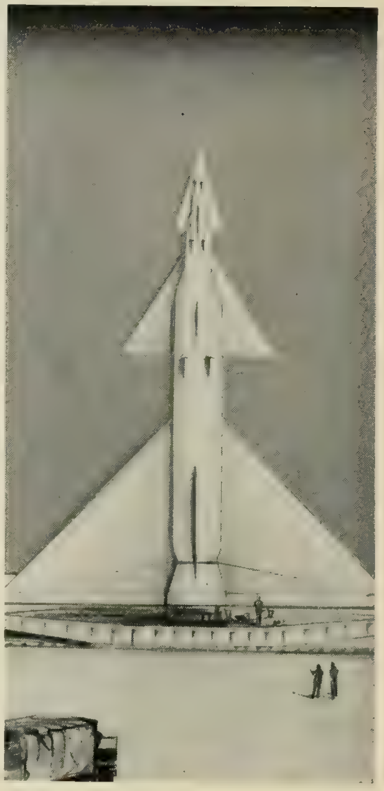
be excessively out of good proportion.

Furthermore, it is believed that the *Meteor Jr* recoverable booster system enjoys a marked economic superiority over an expendable booster system. This economic superiority ranges from 1/3 to 1/10 the cost of the expendable booster system, depending on the nature of the missions and the total number of flights required.★



Goodyear

ARTIST'S CONCEPT of the minimum-sized METEOR JR. being readied for firing on the launching pad.

REFERENCES

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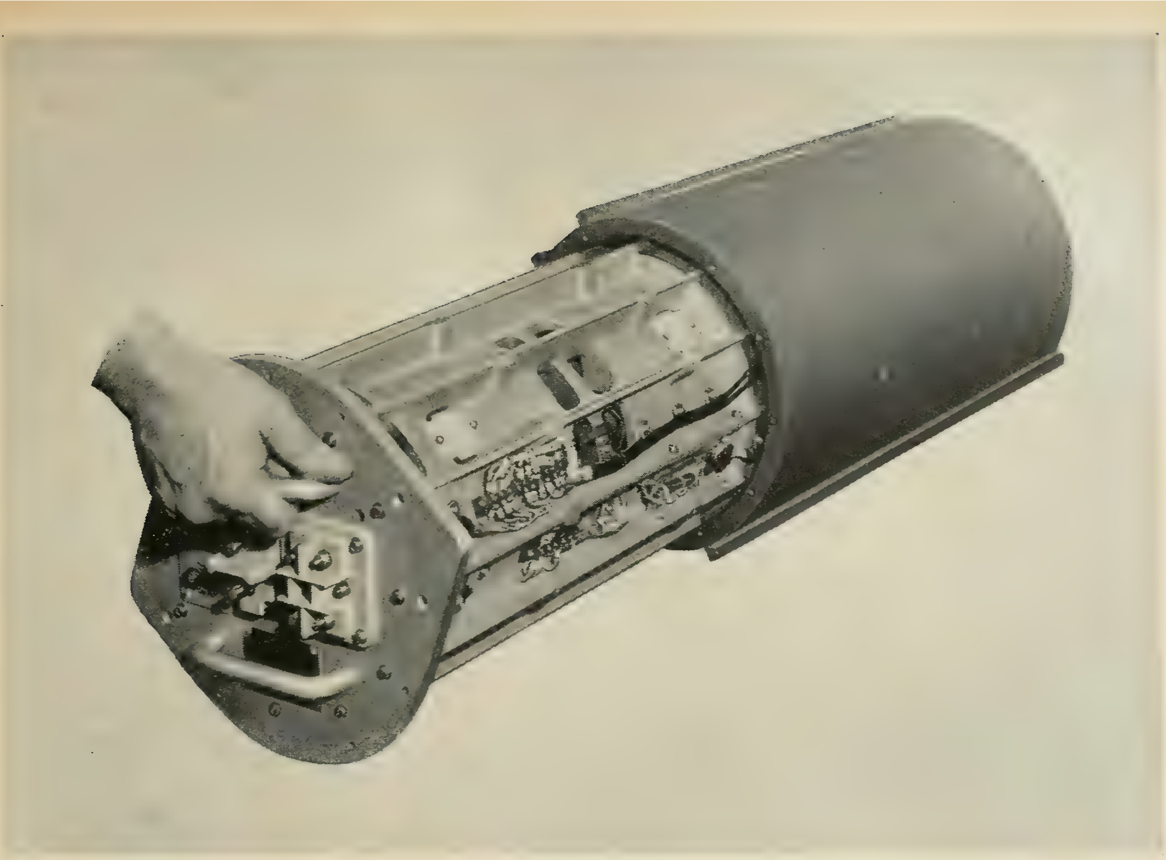

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Budgeting for the Space Age

Why is it so hard to get good estimates on cost of programs? Here are some answers

by **Seabrook Hull**

A TOP BUDGET OFFICIAL at the Pentagon told m/r recently:

"Before October 4, I could have told you exactly what the defense budget would be in fiscal year 1960 and 1961. Now, I haven't any idea." No one in the Pentagon really knows what even the first space flight projects will be, much less which long-range projects should be picked. Nor will they know, until they have rationalized basic budgeting procedures.

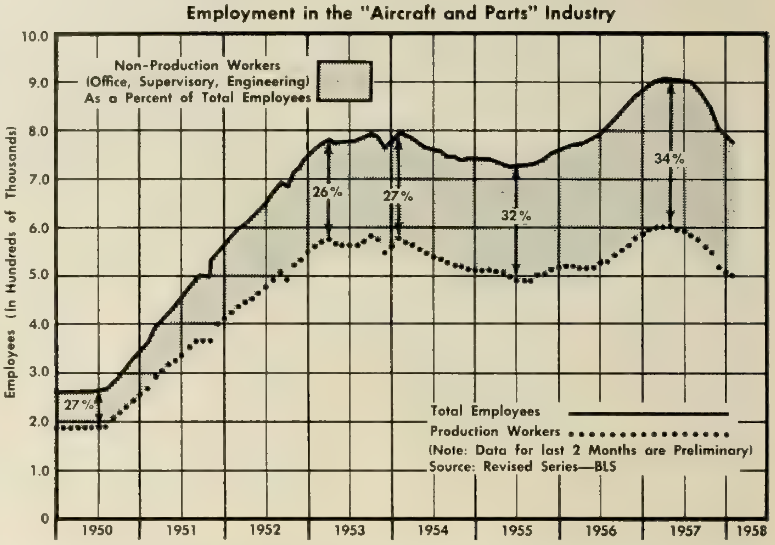
It cost the American taxpayer $700 million "not to get *Navaho*." From the time money was first appropriated in 1951, through 1959 (projected), our big ballistic missile programs (ICBMs, IRBMs, FBMs) will have cost us over $6 billion, not including military pay, etc. This total doesn't include all the massive facilities required for operational deployment of these birds, nor the cost of the bare missiles themselves—with such price tags as $2 million each for *Atlas;* $1 million for *Thor*.

There's talk of a requirement of perhaps 40 *Polaris*-launching submarines, at $60 million each—a total of $3.2 billion, again without the missiles. Each submarine will carry 16 *Polaris* missiles, which will run the total *Polaris* systems bill up at least another $1 billion. *Bomarc* as finally deployed may add another $5 to $10 billion.

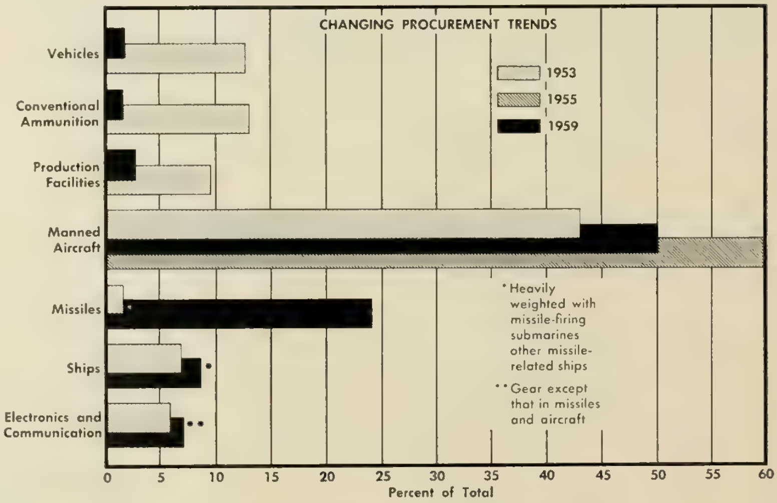
Even the little birds like *Sparrow* III, *Falcon, Nike, Terrier, Bull Pup*, etc., cost from $10,000 to over $50,000 each when produced and bought in thousands. Again, ground-handling and other ancillary costs (running usually to many times the cost of the birds themselves) are not included in the figures.

• **And space to come**—These are just a few samples of the costs of this interim age of missiles. Yet they serve to demonstrate that this is the most expensive era we have ever encountered. And, we haven't even begun to think of space—space, the age when a single vehicle may cost $1-billion just to develop; when an operational capability may top $1 trillion.

However, budgeting for missiles



PROPORTION of overhead personnel to production men in the aircraft and parts industry indicates the relative rise in overall costs attributed to overhead increases. This trend has greatly increased labor costs.



DRASTIC CHANGES in defense policies have resulted in almost revolutionary shifts of expenditure toward entire new industries geared to the space age. The decrease in conventional weapons is obvious.

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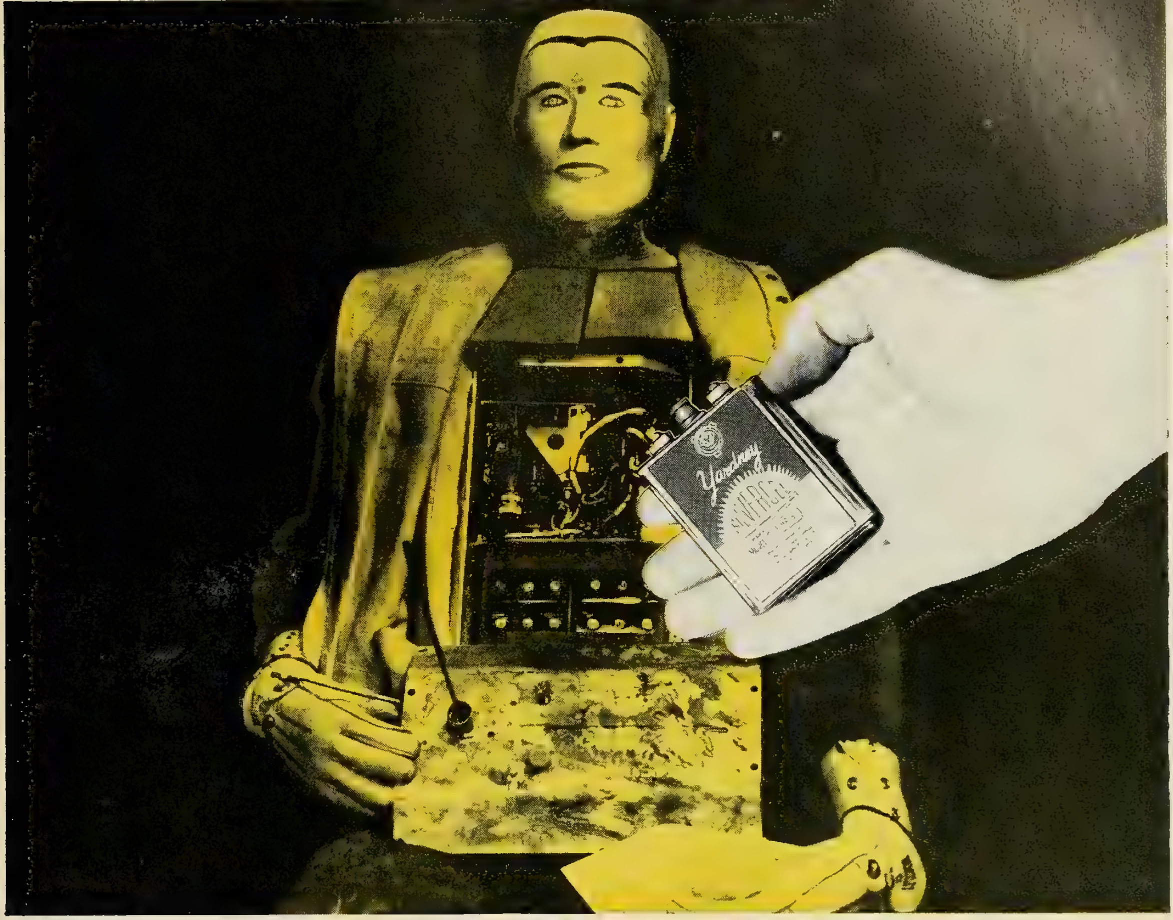

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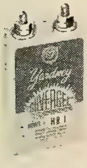

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provides a preview of budgeting for space flight. And those experts in government and industry who have reason and insight to look ahead are gravely concerned with what they see. In a word, the United States is already pushing the limits of its capabilities, not only financially, but technologically, politically and industrially as well. Yet despite this fact, we are forced daily to shelve for now, or forego entirely projects considered absolutely essential by some of the most competent military brains in the country. Reason: we can't afford them.

This is all in the missile age. Yet, it is an accepted fact that space flight, once it gets going, will compound the costs. It is a dilemma. At least it is so long as Russia can selectively choose her fields of battle, while we try to cover all eventualities. However, it is not a dilemma without answer. But in resolving it we may bring about even more radical changes in our way of government, our economics, our attitudes, etc., than we now contemplate.

The initial problems of space-age budgeting are manifiold, including: education; inaccuracies (both intentional and inadvertent) at planning and budget sessions; overlap of old with new military concepts; the leapfrogging pace of technological progress; obsolescence; selectivity; contracting methods; performance on contracts; utilization of resources; financial and political limits; costs estimating. The problem in a nutshell: to get inspirational-but-low-cost results through systematic planning.

Overriding, there is always the conduct of U.S. policy in world affairs. Though not strictly a part of military budgeting, it most definitely controls the level of military preparedness—thus, expenditures. This article is not concerned with the conduct of U.S. foreign policy, but assumes the competition between the United States and Russia, and thus the race for space, will continue indefinitely.

We must go into space. And, as always, we'll have to pay for it. This much we know. But beyond that we are groping. Here's a rundown on the problems and the current thinking on their solutions:

- **Education**—Education in the case of space-age budgeting refers to the problem of (1) convincing top planners of the need to go into space and (2) their acquiring enough general knowledge about specific things for them properly to guide our effort.

Though critically hampered by the self-interest and innuendo of bitter interservice rivalry, this is happening. That man can go into space and that, say, the moon has a direct military significance is now accepted. Only the details of how best to go into space remain in doubt. This includes, for example, recognition and appreciation of wholly new methods of approach—original thinking.

- **Inaccuracies**—A major problem is finding out just what should and should not be attempted. This depends, for one, on an accurate determination of the status of various projects and the level of development of various technologies.

These cannot be accurately determined so long as top military men present slanted pictures to both the Secretary of Defense and Congress. This occurs all too often, either intentionally or through inadvertence due to improper briefing by subordinates.

The Congress and the Defense Secretary are aware of this but, as yet, have taken no positive action to stop it.

Meanwhile, optimum planning for beating Russia in the military space flight area, within the limits of U.S. resources, remains impossible so long as fact is clouded in half-fact, opinion, service politics. At least top Pentagon officials now recognize that they cannot trust everything they are told.

- **Overlap**—Ever since World War II, this has been a serious problem. While whole new concepts of warfare are being proved, conventional forces must be maintained in up-to-date operational readiness, "just in case."

In large measure this means double spending. This kind of overlapping—ICBMs plus SAC bombers or spacecraft vs. aircraft, for example—is not susceptible to any easy solution, but must depend on judgment to keep overlapping costs to a minimum. We can gain some leeway this way (see bar chart) but not enough. Increasingly, the cost of new weapons have forced us to shave conventional forces. If anything, this trend will accelerate as we move into space. For example, we gained $4 billion in "new" programs, 1959 over 1953, merely due to cutbacks in vehicles, manned aircraft, conventional ammunition, etc.

- **Leapfrogging science**—It used to be that progress in weaponry occurred step-by-step. But while today it may take five years to progress from, say, step one to step two, it may also only take six years to jump directly from step one to step four. Is it more equitable to move in sequence from the B-52 to the B-58 to the chemical bomber (WS-110) to the atompowered airplane to (finally) the manned space bomber, or is it more equiatble to skip a couple of the intermediate steps and go directly to spaceships?

Actually, this oversimplifies the problem, but the step-by-step route costs immeasurably more than leapfrogging and takes a great deal longer. The tendency to start projects should be no less than the willingness to cancel them—or at least to knock them down from a weapons-system to a technological study. For example, when *Navaho* was canceled the decision might have been made to continue development of large ramjets, which have a great potential for close-in (40,000 miles) space flight.

- **Obsolescence**—This is tied in directly with the problem immediately above. In the step-by-step (or simultaneous) approach to development, a breakthrough may obsolete whole concepts overnight. Top Pentagon concern over this is mounting, and is increasing the willingness to cancel.

"To cut through to the truth," is one of the main reasons for setting up Defense Department's Advanced Research Projects Agency. If it goes as planned, it will be a powerful influence on the military's conversion to space flight.

- **Selectivity**—In the past, whenever the United States faced a new military requirement, it could and did take several approaches to its solution. This was back in the days when weapon systems were relatively cheap. In the space age, the shot-gun method will have to be abandoned. Of the many, many proposals for a "global surveillance system," for example, only a few will be study or preliminary design contracts. Even fewer will reach any kind of hardware stage. Only one, probably, will ever reach the production state. This harsh selective approach is dictated purely and simply by cost. And, it's effective only if the "right" project is chosen.

- **Contracting methods**—The wide variance between Army, Navy and Air Force contracting procedures, and costs and results obtained has led the Pentagon to initiate a detailed study (now underway) of the various methods of doing military business—AF's method of placing systems contracts with industry vs. Army's technique of keeping the systems responsibility with the various arsenals; Army's unique co-contracting system used, for example, on *Jupiter*, etc.

Another possibility: More and

more of the military arsenals and bases will be reorganized along corporate lines, particularly as regards bookkeeping. This has already been established (with marked savings) in shipyards, fuel supply offices, etc. Greater cost accountability in the military establishments will have its effect on industry.

• **Contract performance**—Target is the contractor who knowingly bids or negotiates low just to get the contract (or simply due to bad estimating) and then asks for and gets one extension of funds and time after another.

Pentagon is considering several methods of attacking them. One would involve giving contracting officers more authority to place contracts, meaning they would ignore the low bidder if they thought he would fail to perform according to terms. This has obvious disadvantages. Another approach that is held in more favor (but which faces stiff political opposition) would let size of profits on contracts very with performance, both up and down.

• **Utilization of resources**—This is primarily a manpower problem. But there's no point in budgeting more projects than we have the technical ability to handle. Right now 35-to-40 percent of all first-level scientists and engineers in the United States are working on government or government-supported projects.

Surveys and experience reveal that this is about the limit, without reverting to some kind of draft—either direct or indirect. Reasons include: many scientists just don't want to work on government projects due to security rules, red tape, etc.; can get more money developing a better car or deodorant, etc.

The Defense Department has decided that any military budget materially above the current $40-billion level would rapidly dilute our technical talent to a point where the more money we put in, the less we could get out. Nevertheless, we are faced with the prospect of a $1-billion-a-year increase in military and/or space flight spending for some years to come.

• **Financial and political limits**—This goes to deficit financing and/or higher taxes. To give even half the present serious space-flight proposals a proper try would cost us twice as much as we're now spending on defense, upward of $80 billion. Individually, Army, Navy and Air Force wouldn't have trouble hiking that total to $150 to $200 billion.

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pay for this—deficit budgeting, which sooner or later would bankrupt the country through inflation; higher taxes, which are politically out of the question. Also, high taxes would eventually sponge up all the money for industrial expansion. Thus, even if there were no other limiting factors, money alone will force a major rationalization of the Pentagon's approach to budgeting.

- **Estimating costs**—This is one of the most complex budgeting problems of all. Labor and material costs are constantly on the rise. Bureau of Labor Statistics figures help to chart these. But in the more exotic areas, such as space flight (either manned or unmanned), they defy forecast. No one now can tell the extent of complexity—or simplicity.

Take, for example, manned reentry. This can be accomplished with wings and the "in-and-out" skip method, with retro rockets, with steel drag 'chutes, with magnet drag or—who knows? Which is cheaper now; in the long run? Which is more or less complex? How do you balance low-cost - but - maybe - primitive availability now, against long-term development potential? How do you balance, and having balanced, how do you choose? What are the criteria?

These are budget problems that run up the cost of any program. The difference is that in the past they were luxuries we could afford. Now it's difficult to see how we can afford the space age on a bare survival basis, much less with luxuries.

Contemplate, for a moment, a manned round-trip exploration of Mars under present budgeting procedures and levels of technology—or an operational base on the moon manned, maintained and serviced. They make present-day missile costs look like peanuts. These projects run to tens, even hundreds of billions of dollars.

Yet, within the next quarter century, we will be compelled not only to build a base on the moon, begin exploration of Mars, but long before that we will have to have operational military space capabilities patrolling the "immediate environment of earth." We can gain some by splitting the responsibilities among our allies and coordinating our efforts. But the bulk of the burden will inevitably fall on the United States. We can only do it, if we become efficient.

This is the one basic secret of space-age budgeting, one that requires unselfish cooperation from everyone concerned in any way with the space program.★

Food on Film—Best Space Diet?

Packages for food and other supplies for space travel may be made of edible, "vitamin-loaded chemical films," according to an Air Force packaging specialist.

Speaking before a meeting of the Southern California section of the Society of Industrial Packaging and Materials Handling Engineers, Albert Olevitch, chief of the packaging laboratory at Wright-Patterson AFB, said that if food value can be put into a film it would become a favored packaging material for space shipments.

Pointing out that films used today on such food items as frankfurters are digestible, he declared that it is entirely probable, that soon, containers will not be tossed into the ash can.

"They will be eaten or used as plant food," Olevitch predicted, "or they will be converted through some means into useful gases or some other product."

Noting that every ounce of material taken on a space flight must be made as useful as possible, the AF specialist said that packaging and other elements of supply must be considered along with the building of vehicles. Increasing priority is being given to packaging research and development in problems related to space operations, he added.

The lack of moisture in space will eliminate rust, but the relative vacuum of space increases problems of shock protection for packaged goods.

Acceleration and vibration factors in rocket vehicles are not expected to be as troublesome to packaging engineers as potential damage caused by accidental dropping of a package by a worker carrying it on the moon. As there is no air resistance, it is theorized that the impact shock would be prolonged; the dropped item would shudder for a long period after landing.

• **Dinner—bags of film?** Olevitch said the first container need for space travel will be those for cargo operations between earth and a space platform. Flexible, high-strength, nutritious films formed into bags or restraining walls appear to be the best solution. Where rigid containers have to be used, they probably will be made of aluminum or magnesium, or a new edible material.

Packaging engineers also will have a problem in designing test-instrument containers for moon drops. One possible solution is the use of compressed air to automatically inflate plastic bags to cushion the landing impact. To prevent the instruments from vibrating for long periods, the bags would have to be precisely punctured on impact so they would collapse gently.

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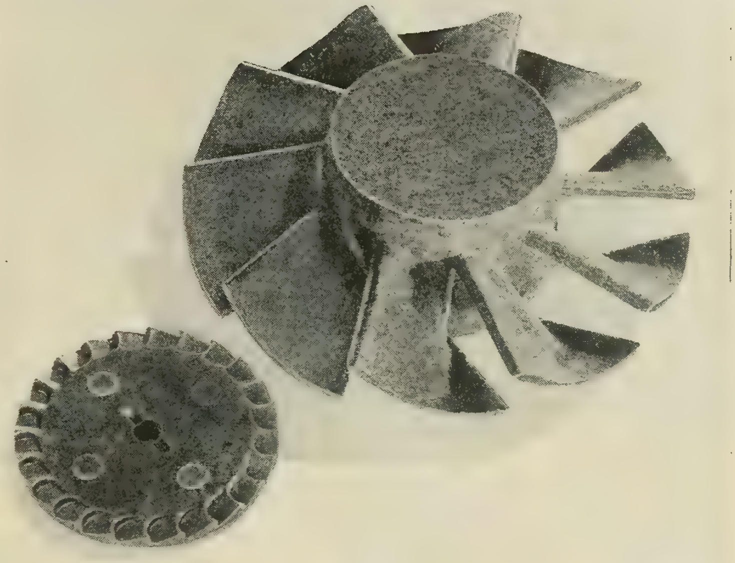

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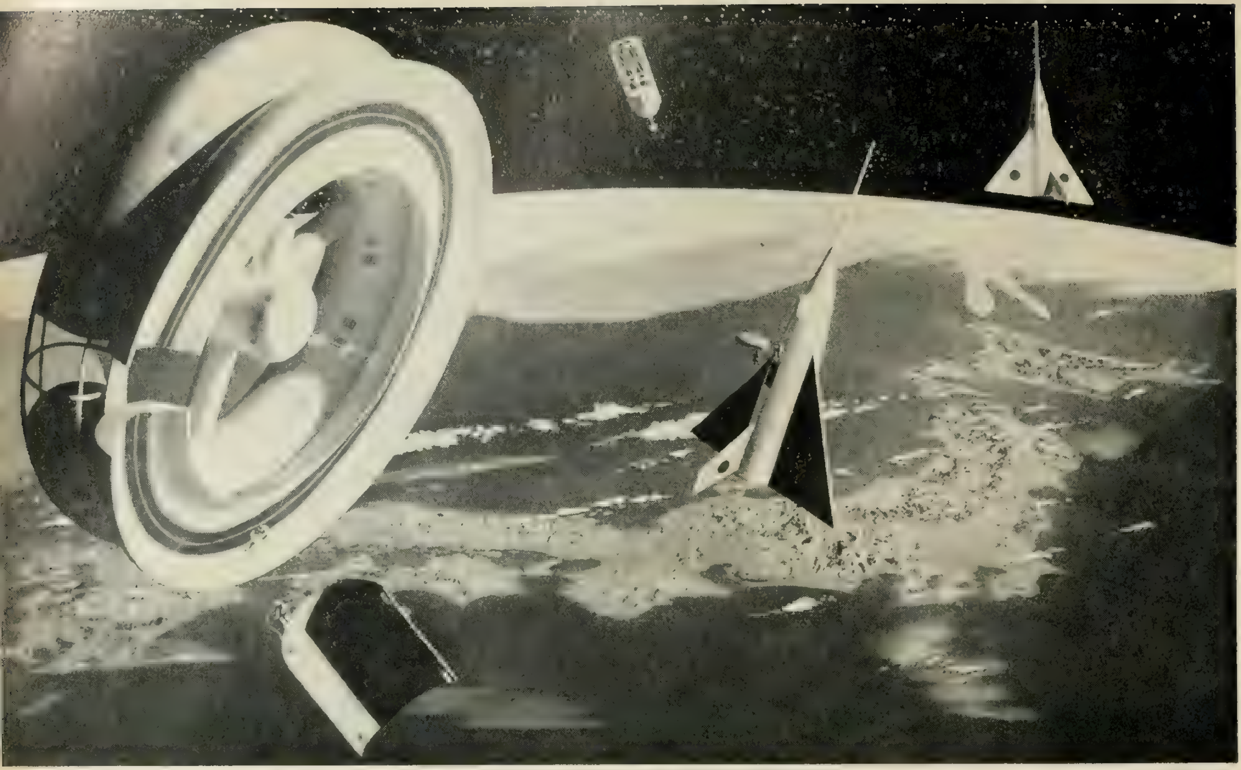

Itokawa

Social studies must go on, to find out . . .

How To Keep Space Crews Content

by Donald N. Michael

WHEN WE CONTEMPLATE the social psychology of space crews, we are attempting a far more difficult thing than is the case when we predict the hardware in which these crews will be sent into space. The social psychology of group behavior has far to go to reach the state of advancement on the hardware side—in spite of the spectacular work of psychiatrists, social psychologists and cultural anthropologists.

Therefore, it is not possible to state categorically the sociopsychological problems to which space ship crews will be exposed, nor the training and selection procedures that may be used. What can be done, however, is to list some of the social and psychological circumstances and consequences which probably will have significant implications for space crew operations. Such a list makes it clear that we cannot be sanguine about man's capacities to work effectively in space over long time periods.

Flights of less than, say, two-weeks duration probably won't produce as many of the problems to be described, though trouble can arise at any time.

• **Environment is first**—The first spaceships may carry crews of more than one and, say, less than six. (If the crew were much larger, interpersonal relationships will be such that the fact that they are in space will make relatively little difference.)

Volume per crew member will be at a premium. Even if the ship is constructed in orbit, the cost of construction will increase with the size and facilities of crew quarters, since the materials will still have to be ferried from earth. It is assumed that there will be no radical breakthrough in propulsion methods—if volume per crew member is essentially unlimited, many of the special sociopsychological problems disappear.

The nature and mission of many spaceship operations are such that the diversions available to crew members will be relatively limited and monotonous. All there is to respond to are the instruments, other crew members, and whatever items are provided for recreational and off-duty purposes—limited because of cabin space constraints. During the freeflight periods of the trip there will be little vibration or outside sound. Even "viewing the scenery" will be limited, since micrometeorites would abrade an unprotected optically clear surface. Hence viewing may be infrequent.

And, when the crew does look at the universe, away from the sun, it will see blackness, with myriads of steady points of light of slightly different colors, all of them so far away that there will be no sense of depth. Toward the sun, the intense contrast between light and dark will make view-

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The author is senior research associate, Dunlap & Associates, Inc., Stamford, Conn. The views are those of the author and do not necessarily represent those of Dunlap and Associates, Inc.

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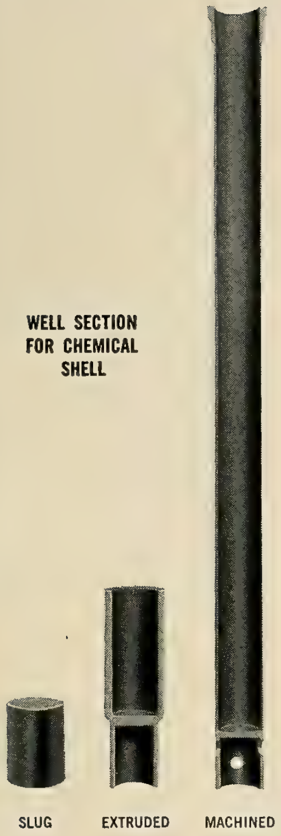

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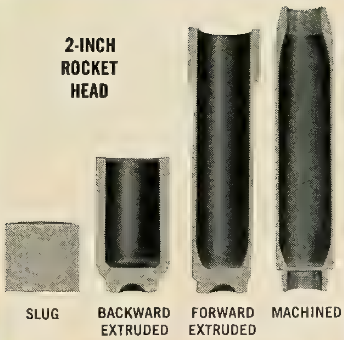

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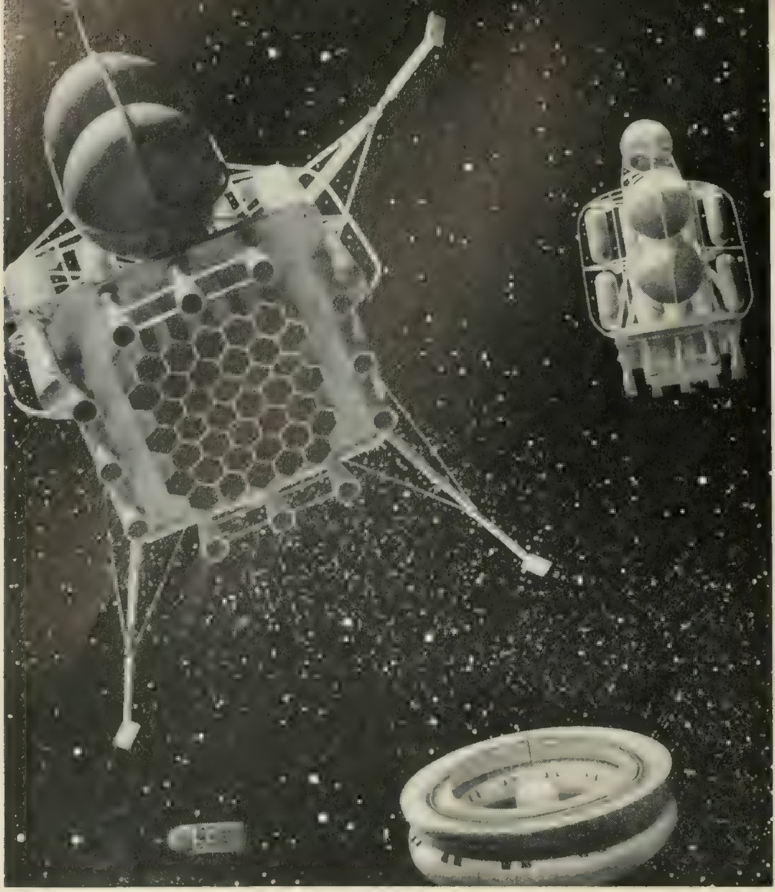

Itokawa

. . . Keeping Space Crews Content

ing painful or at least very difficult.

Since the constellations are likely to appear in different arrangements from those perceived on earth, there will not even be this familiarity to orient upon. Thus, the universe may not offer much in the way of stimulus novelty. (Satellite occupants may have a better time of it with the earth to look at.)

Finally, disaster will be close at all times: from meteorites big and small, from equipment malfunctions, from human malfunctions and probably in the long run, from genetic damage to crew offspring from cosmic rays. Early spaceships and their crews will most likely represent an ecology with almost no tolerance for error or malfunction.

• **Then social**—The social and psychological factors combined with the environmental ones, may also generate personal and interpersonal behavior that could mean the difference between success or failure.

It is obvious that the crew will have to be carefully selected. But what standards, screening, training procedures must be developed to produce a crew that can cope with such an environment and with each other?

First, it must be assumed that membership in a space crew will be voluntary, and that volunteers have been fully apprised of the dangers they face. Who would volunteer for this activity? We might list men attempting to escape from something; men who want to prove something to themselves or to others; men who are curious about new experiences; men dedicated to service, either military or scientific.

These people are willing to go into space in spite of the unprecedented and extraordinary hazards. Thus, whoever they are and whatever their motives for volunteering, they are not likely to be "normal" human beings—normal humans find less risky means of meeting their problems. This is not to decry these motives; they have often served the human race well. But the origins of these motives must be understood in order to evaluate their consequences, under the circumstances faced by space crews. The man who is dedicated to military service may not be able to endure boredom as well as the man out to prove compulsively that he is better than his father was.

The problem, then, is to find the combination of normality and abnormalitys that will make the best team members.

"Team members" is the important term here: an antisocial, possibly slightly schizophrenic, personality might survive adequately in a one-man spaceship. Such a man probably won't do on a team. And yet, will the typical socially interactive and dependent personality do either?

• **Too close?**—The adage says that familiarity breeds contempt. Under some circumstances it breeds more than that: in constricted quarters it may well be a major threat. French anthropologist and explorer Gontran de Poncins spent part of a winter with an eskimo trader, Paddy Gibson, in an isolated outpost and had this comment in his book KABLOONA:

"I liked Gibson as soon as I saw him, and from the moment of my arrival we got on exceedingly well. He was a man of poise and order; he took life calmly and philosophically; he had an endless budget of good stories. In the beginning we would sit for hours . . . discussing with warmth and friendliness every topic that suggested itself, and I soon felt a real affection for him.

"Now as winter closed in round us, and week after week our world narrowed until it was reduced—in my mind, at any rate—to the dimensions of a trap, I went from impatience to restlessness, and from restlessness finally to monomania. I began to rage inwardly and the very traits in my friend . . . which had struck me in the beginning as admirable, ultimately seemed to me detestable.

"The time came when I could no longer bear the sight of this man who was unfailingly kind to me."

Both military and civilian sources indicate that under conditions of persistent danger, constrained operating environment, and mission-length of unusual duration, similar responses have characterized relationships between crew members in relatively conventional, but technologically advanced environments.

Thus, it might be that a likely combination of personalities, would be persons who are almost social isolates. Such men would be intolerable or infuriating under conventional conditions. But such personalities might be sufficiently insulated from the others to permit them to maintain themselves as an operating unit.

Of course, there is at the moment, no certainty that these social isolates would effectively fulfill their technical functions. After all, if they are so insensitive to their fellow crew members, it may be that they will be insensitive to the social commitment they accepted: to perform certain technical tasks with required precision and intelligence.

• **Weightlessness a factor**—Does the operational outlook for a more socially interactive crew look brighter in spite of the difficulty of keeping each from becoming hateful to the other? In some ways, yes. For example, man's self-image derives in part—and in good part is maintained—by his learned awareness of the sensations and responses of his body. It is also defined and maintained by his learned responses to, and awareness of, the environment in which he lives.

Since a prerequisite for initial screening will be excellent physical condition, it is not difficult to imagine that many of the personalities whom we might consider for space crews would have more than the average awareness of their bodies. And since another prerequisite must be special competence and special interest in the mission, he will have had more than an average exposure to an environment rich in content and change.

But in a space cabin the crew member is probably going to be weightless and the environment is going to be stimulus-poor.

Weightlessness means that there will be many things about the operation of the crew member's body which will be different, and which he will not be able to control as easily or as precisely as had been his want.

In effect, then, his self-image is threatened. For example, the man who assuages his anxieties about his masculinity through his physical control, might find himself anxious about his masculinity if he loses this control. Unless otherwise reassured, say, by his fellow crew members, he might attempt to "prove" his masculinity in other ways—such as bullying.

Psychological difficulties possibly arising from lack of weight can't be ignored. So far about one-third of the subjects exposed to weightlessness found it definitely distressing while another one-fourth found it "not exactly a comfortable feeling." The exposure time has been less than one minute. There is a long way to go before it can be concluded that weightlessness will not present important psychological difficulties.

The social isolate would also suffer anxiety under these circumstances but for him social support would neither be forthcoming, or as important. The choice of social isolation as a way of life is itself a means of coping with a threatened or tortured self-image.

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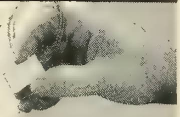

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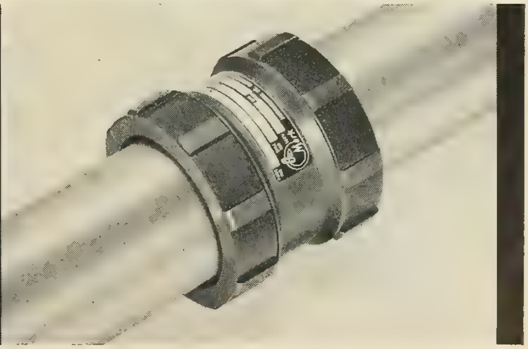

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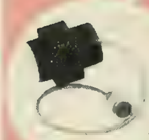

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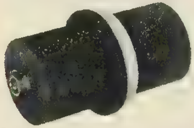

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terdependent crew may help counteract the boredom and isolation of some long space flights. Literature on the psychology of boredom and of low-stimulus environments points in the same direction: emotional depression, intellectual deterioration and a tendency to hallucinations.

This general deterioration of mind is vividly described by de Poncins:

"Insensibly . . .things changed . . . silence that had been so remedial, that had soothed me . . . began to seem to me a weight. The horizon was closing in round me.

"But more than this, an almost physical operation of shrinking was going on. I who had come from outside had first been enclosed by the Arctic. Then my horizon contracted to the limits of Gjoa Haven; from Gjoa Haven the circle had been reduced to the dimensions of the post; and now, in the dead of the polar winter, the line I hesitated to cross was drawn in a radius of five feet round the stove."

Consider then a space cabin, its routine of occasional measurements, the boredom of monitoring the equipment, its physical constraints, its weightlessness and the pervasive sense of isolation. This environment may well produce depression and hallucinations. It may be that only the presence of other crew members will provide each member with criteria for determining when he is hallucinating and when he is not.

It would seem, then, that a crew of personalities at least somewhat emotionally dependent on each other might have some advantages.

But these advantages can only be gained at the expense of weight and thereby cost, since such a crew will require certain adjuncts to the primitive space cabin environment.

Certainly the opportunity for privacy is a prerequisite. The operation of the ship might be so organized that each man is usually isolated from the others—with some central area where they can come together. Some volume will have to be provided for physical exercise; this might also be the meeting area.

Certain stimulus enrichers must be provided: as simple as a kaleidoscope (which has the great advantage that it never provides the same stimulus twice); possibly elaborate pinball-type machine which would encourage the setting of tiny goals and provide the opportunity and the challenge of reaching them.

It may take a TV or radio reception capability to keep the crew truly in touch with reality. It may even develop that mixed-sex crews are the more efficacious for many reasons, not the least of which is that the temperaments and values of men and women are sufficiently different to provide much stimulus each for the other. Mixed crews would present problems, but not unique ones.

In view of the nature of some of the factors contributing to the difficulties in selecting space crews, it may be worthwhile to surmount them by trying to bypass them. One approach worth consideration is that of recruiting crew members from other more sedentary and less time-bound cultures than our own.

• **Training**—It is clear that we face equally vast problems in training space crews. For example, the need to readjust the self-image in the light of the behavior of a weightless body probably can be transferred from the space ship environment to a prespaceship training period aboard a weightless satellite.

It seems clear that we will be able to put crews into space well before devising adequate psychological tests.

Since the satellite itself may for many years be the first and only testing ground for prolonged exposure of space crews, there will also be the difficult problem of selecting men for this crew. Presumably some sort of regimen of one-man-satellite training exposures will be developed in order to select men for this crew, but by any measure selection of the first crews will be difficult.

• **What can be done**—What can we do, then, to develop a plausible social psychology of space crews before the event?

For one thing we can look to the behavior of terrestial explorers for insight into the social psychology of teams living under environmental extremes.

Then too, most exploration was undertaken in an age when men were richer in self-sufficient resources than is the rule today. This inner strength is even less likely to be the rule as population and urbanization increases and imposes greater pressures toward social conformity.

We can continue and extend studies on behavior under confinement presently underway at the Wright Field Aero Medical Labs, and by Lockheed. We can attend more seriously to the work of the psychiatrists and the cultural anthropologists. We must come to understand that the social psychology of space crews is essentially a problem in the social psychology of society. Larger crews, plenty of room and sufficient diversion would eliminate many of the problems which give space crew life its special and difficult characteristics.★

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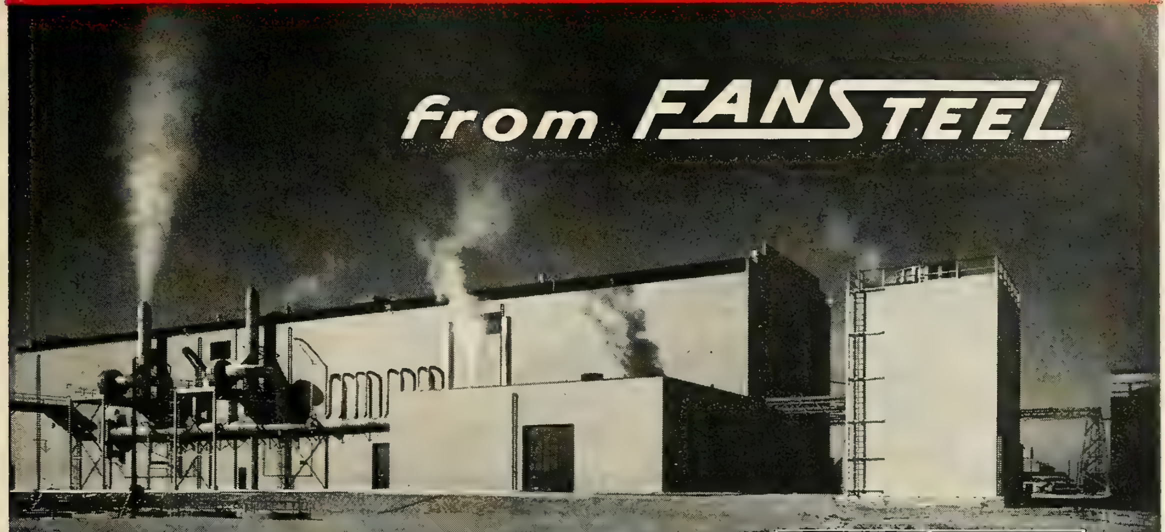

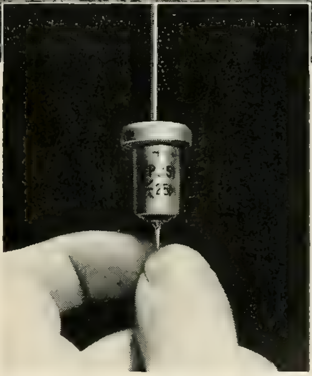

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Q: **Why should we explore space?**

A: (Tolcott) In my own opinion there are two main reasons: one would be the collection of scientific information which would be useful to mankind in general; the other is the collection of information that would be militarily desirable to the United States.

Q: **Well, do you think that this is any more urgent now that the Russians are already up there with Sputnik?**

A: (Tolcott) I think with good planning this shouldn't have any effect.

Q: **Do we have good planning right now?**

A: (Tolcott) I think the new emphasis on scientific research is perhaps the most important manifestation.

A: (Orlansky) I dare say a year of planning is necessary; if the planning was good, it would be time well spent. None of us, I'm sure, are so gifted that we have all the knowledge necessary for space flight, now or even a year from now. However, for political purposes, one might want to get some action as quickly as possible.

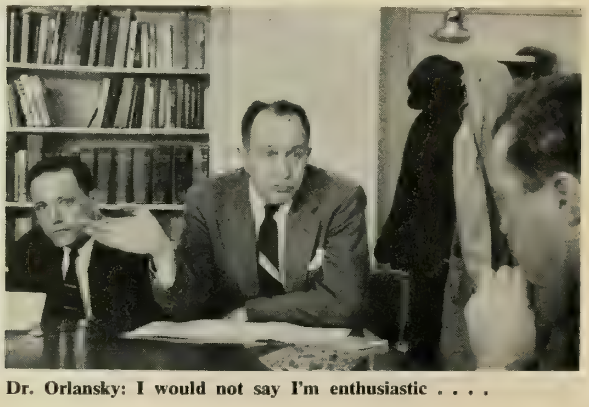
A: (Barmack) I would like to supplement Marty Tolcott's two reasons for exploring space with two others: he mentioned (1) military and (2) scientific. To these I would add (3) economic and (4) political. I am highly dubious of the military value of going out into space.

Two military functions have been suggested by official sources: to provide a platform for releasing bombs; as a reconnaissance device.

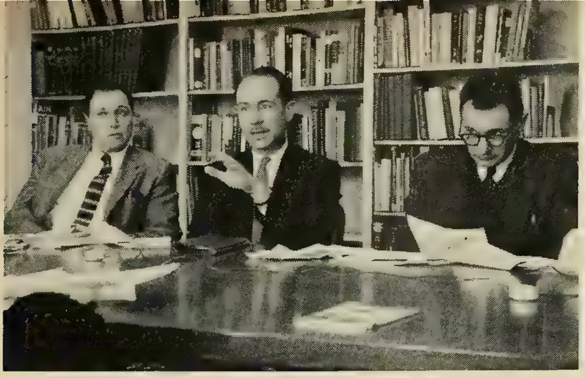
Q: **Would anyone like to enlarge on the planning aspect?**

A: (Yarnold) I would like to make a statement on planning. I don't think any scientist can ever sit down and so an so *should* be done. But he can do a study as to what might happen if so and so *were* done. I do not believe that there has been enough operations research devoted to the question of what do we gain or lose through various sorts, sizes and shapes of space programs. The public has been complaining that it's now six months since Sputnik and we still haven't a program. I think you're right—that there has not been any real scientific effort to study what such a program should be. There has been only some talk.

Dr. Michael: Two other things have to be added . . . .



Dr. Orlansky: I would not say I'm enthusiastic . . . .



Dr. Yarnold: I think the cost would be trivial . . . .

Dr. Barmack: When all is said and done . . . .

Q: **How long do you think we will have to talk?**

A: (Yarnold) Unless we adopt a scientific method of evaluating the probable consequences of each type of action, we'll talk forever. First we should set up a study group.

Q: **Who should these people be?**

A: (Yarnold) They should include many types—economists, psychologists, physicists, engineers. They should have a definite mission, a definite budget and a definite time limit. You might require some decisions within three months. I do not think it's being done now. Over and over again, very commendable and competent groups make studies, and the results are buried because whoever sponsored it doesn't like the results.

A: (Michael) Two other things have to be added: It has to be a group which is not obligated to beg any questions, and it ought to be so set up that findings are published—even if in sanitized form.

Q: **Will you elaborate on this study group. How big should it be?**

A: (Yarnold) You ask me to speak very much off the top of my head—just what I'm objecting to doing.

But I would think that the group itself should be fairly small, but very high level. We have background for such a group in the Weapons System evaluations group. Their charter is something like what is needed. They should have at their disposal lots of sub-groups.

The basic leading group itself should be small, to prevent discussion and study going on forever—there should be a definite time limit. The group should have a budget and be told to come up with its best recommendations at a definite date.

I think the cost will be trivial compared to what we can gain—it could probably come up with a very good study in perhaps three months or less, and spend less than $500,000.

Q: **Let's ask the question—Do you think it should be military or civilian?**

A: (Barmack) In that connection, Vice-President Nixon was recently quoted as saying that the exploration of space is a civilian task. He said that the goals of basic research in the space field should not be set by the military—we can't tie down our scientists to specific objectives that military or political leaders may deem possible.

A: (Yarnold) It depends on what you want. If you want to go out to fight, then you're just as well off letting the military set the research goals. If you want to go for some other reason—to advance science—then you might turn it over to civilians. If you have an applied objective the fact that a program is turned over to civilians doesn't make it basic research.

You know, you asked me a while ago to talk off the top of my head about what I would really like to see. Speaking for myself, I'd like to see a Congressional committee set up the study. It would thus not be tied either to the military or civilian side—but the government as a whole. It might even work.

Q: **Let's assume the action you suggest has been taken, the study is made and is successful. Then what will happen to their recommendation to Congress?**

A: (Yarnold) The recommendation would present a choice to the parent Congressional committee.

Q: **Where would such a recommendation lead?**

A: (Michael) I feel that if the findings are to be implemented, the report has to be prepared in such a manner that its findings will be the responsibility of im-

Dr. Michael: Let's take a runthrough . . . .

Well, we can wind things up . . . .

portant leadership in this country . . . as did the Rockefeller and Gaither reports. If it's just a report without big name behind it, it may very well die on the vine, no matter how good it is.

Q: **Let's switch again, to another important phase. What about education? There is a disagreement about whether we should teach astronautics in the schools. Should we augment the educational program, and to what extent would we include astronautics?**

A: (Barmack) This question can be broken down into many sub-questions. As you know, the Air Research and Development Command has been considering development of a post graduate university for training astronautic scientists. I don't know what the current decision is—at last reports, it had been cut out for budgetary reasons.

One may also raise the question as to whether you should have a special form of engineering training at the college, in addition to the post-graduate level. Finally, how far down in the educational system should instruction reach—down to the high school?

A: (Tolcott) It seems to me that there's a lot that can be done by augmenting the basic scientific courses already in existence. Chemistry and physics courses might be strengthened with some of the information that might be obtained through space flight.

Q: **There seems to be general agreement here, but are we capable of doing it? Have we the manpower and the money to change our textbooks?**

A: (Yarnold) We certainly have the money, and experiments in which a few science teachers are spread around among a large number of students by television techniques are interesting and encouraging.

I think perhaps we have to fight a public posture in which society as a whole seems to be afraid of science.

A: (Barmack) May I throw in a note here? It is very easy for us to identify problems that require a mathematical or physical science approach for solution. But it takes more than math, physics and engineering to win the struggle. Aren't we plugging for the wrong disciplines?

A: (Yarnold) I couldn't agree with you more whole heartedly.

Q: **You say that we are capable of improving our educational system, but do you think that we are attempting to do this? Are you satisfied with what has been done?**

A: (Yarnold) No, I'm dissatisfied with it, but I think there is an attempt being made. The thing is being discussed, at least.

Q: **What should we do to get the leadership we'll need to push such changes through?**

A: (Yarnold) For one thing Congress could earmark money it appropriates for education: tie it definitely to teaching of science. Or, we could set up national standards, with nationwide examinations which students are expected to pass at stated intervals.

Q: **Will it require additional funds?**

A: (Michael) It probably will. But in order to get the kind of public support and public interest needed, we will have to get a substantial shifting of American values and standards. This will require planning, and involves more than the physical sciences: considerations of philosophy, sociology and psychology must be brought in.

Q: **Who should do it, and how should it be done?**

A: (Tolcott) It seems to me it should be

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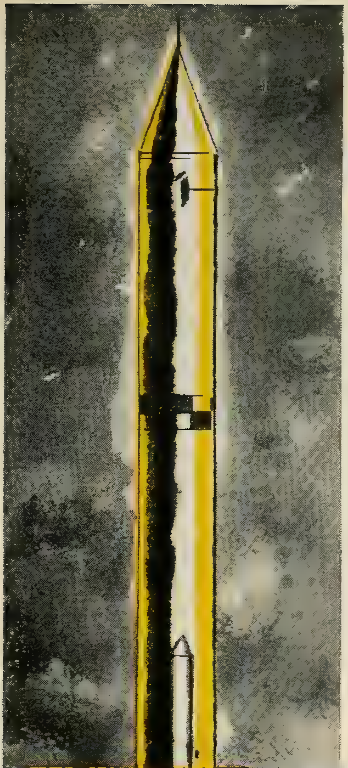

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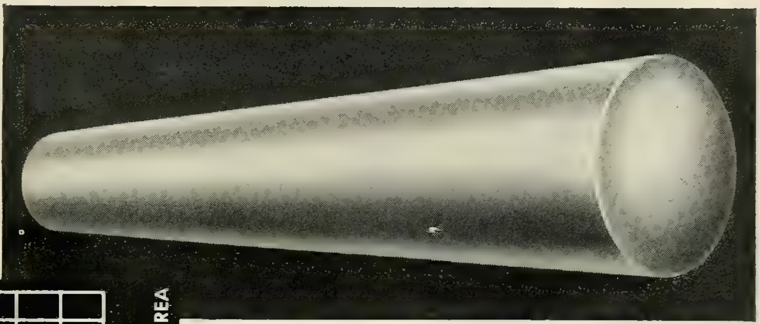

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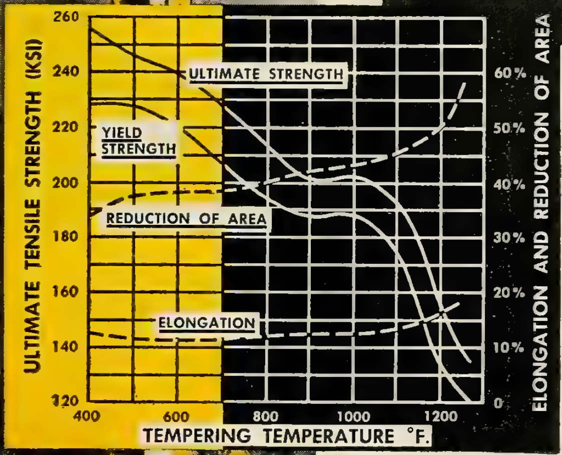

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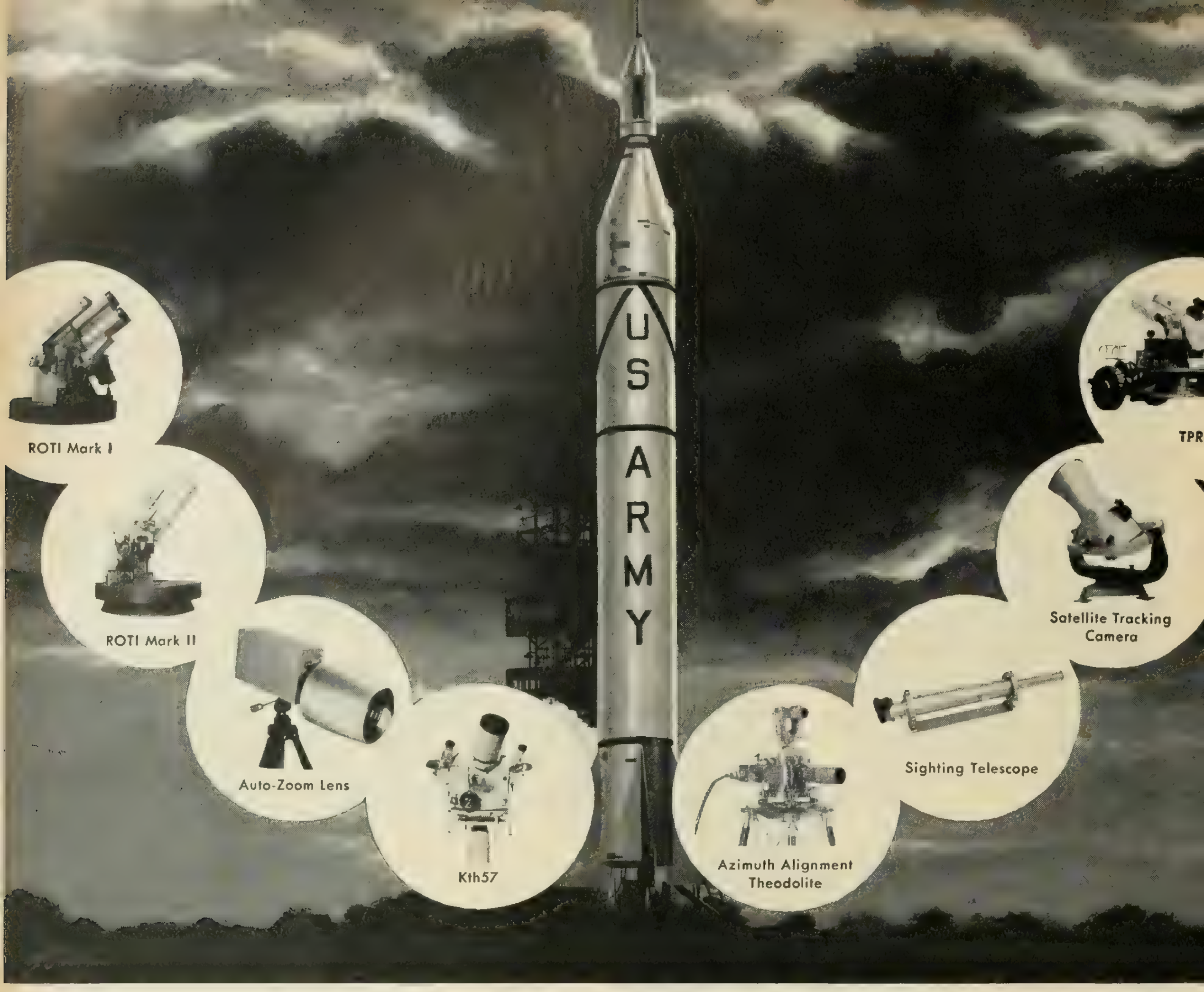

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done on a local level—we as individuals have an obligation to do something in our own school boards. It is a problem to be attacked on a number of levels. On a national basis, I think we should contact our Congressmen and give them our ideas.

A: (Yarnold) Without better education and a lot more education, we cannot solve any of the problems. We can't have an adequate space program.

Q: **Well, do you think this is in any way tied up with the fact that we still don't have a space program—six months after Sputnik was launched? Does the scientific planning take longer or is it being influenced by politics?**

A: (Tolcott) I think I perceive in your question a more limited view of space programs than I'm thinking of. A space program involves a lot more than launching satellites. The launchings are the part that the newspapers publicize most, and which therefore become identified with our national strength. This is unjustified and dangerous. In the broader sense, we do have a space program. The real issue is the relative amount of effort to be allocated to each phase of it.

Q: **What is your opinion right now of the value of space flight?**

A: (Orlansky) I would not say I'm enthusiastic. I am neither for or against space flight. Practically everyone who owns an airplane company wants to transform it into a missile company—therefore they are for space flight and don't need our support.

The ingredient that we can bring to space flight is a degree of rationality and planning so that we will know ahead of time why we are doing it and what we are going to get out of it. We are especially interested in the way in which men will be employed in this venture.

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Q: **Well, I think we can wind things upon that. How does that sound?**

A: (Michael) Let's take a run through and see if anyone has anything to add.

A: (Tolcott) It still seems to me somewhat incongruous to be talking about space flight when, for example, we can't run our trains on earth when the

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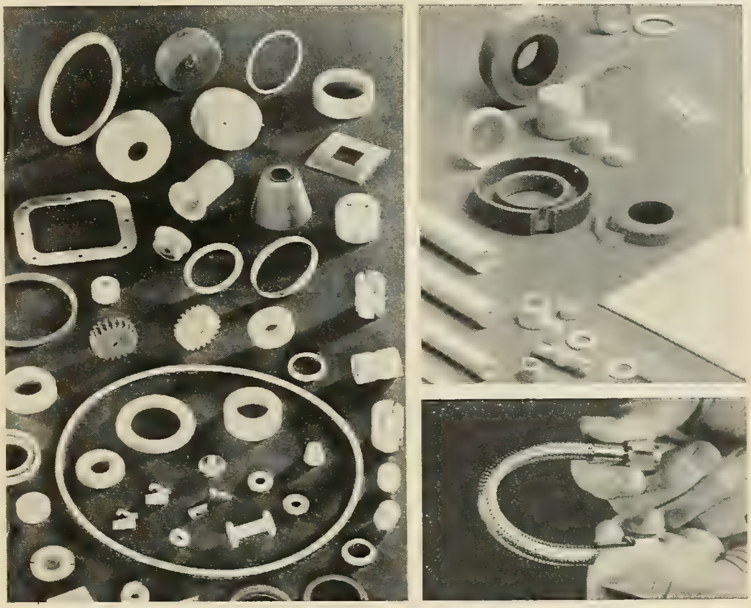

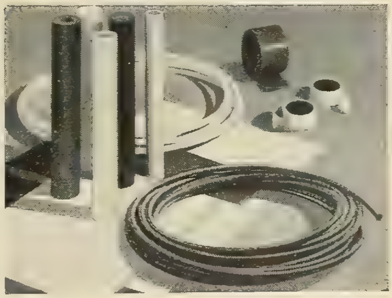

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temperature drops below twenty degrees. It seems to me that there's a big gap between our present technological knowhow and the kind of speculations we've been engaging in during this session today.

I think the only general point I would like to make is that all the problems of how should we explore space; how much should we explore space; should we explore space; are all tied to our national capability, which now appears to be at a lower level than that of the Russians. The real problem which will in turn solve all of these other problems, is scientific education. Without that we have nothing—we never will have a space program that's any good, or any other program that's as good as we should have to keep the U.S. in its rightful place.

Q: **Then do you feel that planning for a scientific education should precede planning for a realistic space program?**
A: (Orlansky) I think the planning for both should be done concurrently. The requirement is for research and planning, not for expertizing. We have research methods readily available to get the facts that will clearly identify alternatives and their possible consequences.
A: (Yarnold) I would just like to suggest that certainly for space flight and for the future ahead of us, we need a scientific education, but my strong feeling is that if we're going to cope with the society that space flight provides—both for good and for evil—we're going to need more than scientific education. We're going to need a humanistic education—in part scientific—for the majority of our population, or we will end up with technological chaos.
A: (Barmack) I would say in concluding what we've been discussing here that for myself—and maybe for all of us—efforts in the exploration of space should be encouraged to a considerable extent. The decisions on government support should be based on a careful assessment of our national goals, the things we might do to achieve these goals, the problems to be encountered, the prospect of success, the costs and the possible utility of the findings that have been made.

Then, when all is said and done we'll get certain scientific information of very great value for military purposes and certain basic scientific information of general value. Either of these could be sufficient justification. And, of course, you can never take away the satisfaction of curiosity and sense of adventure all this will give us and the nation.

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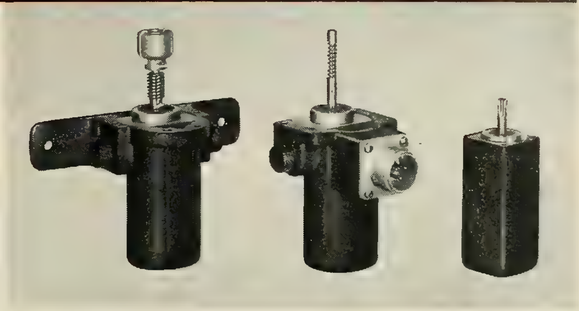

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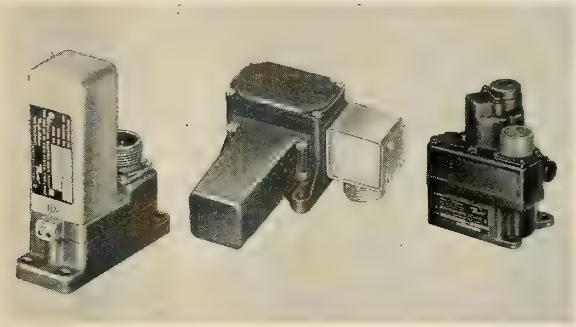

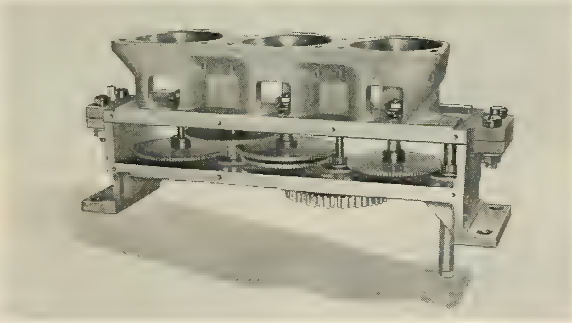

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Guidance and Control in Space

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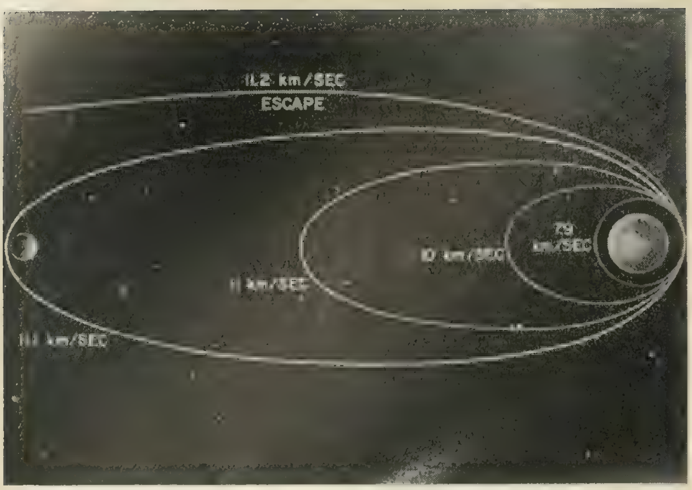
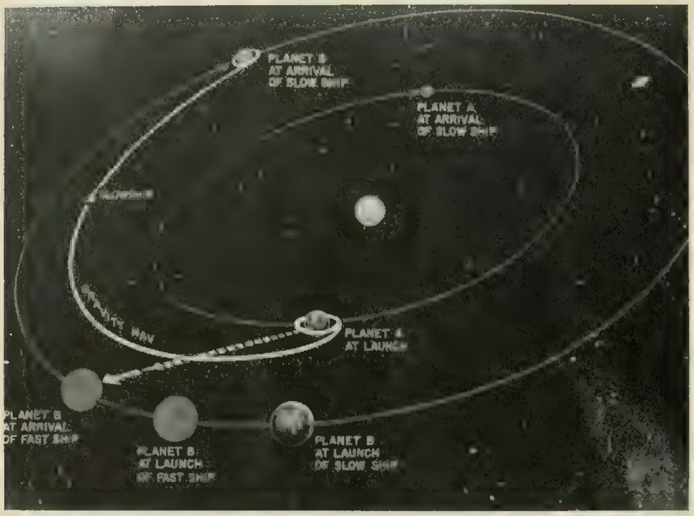

11.2 km/SEC
ESCAPE
7.9 km/SEC
10 km/SEC
11 km/SEC
11.1 km/SEC

The drawing (top left) represents velocities required of a space vehicle for achieving various elliptical orbits between the earth and moon and beyond. The 11.1 km/sec figure represents the velocity for sending a pay load to the far side to the moon. It should be noted that only a 1 per cent increase will produce escape velocity.


PLANET B AT ARRIVAL OF SLOW SHIP
PLANET A AT ARRIVAL OF SLOW SHIP
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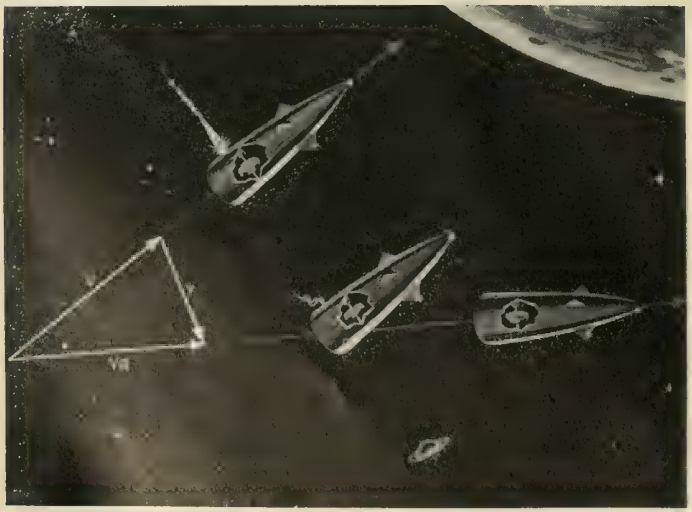
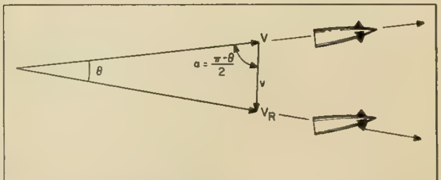
GRAVITY NAV
PLANET A AT LAUNCH
PLANET B AT ARRIVAL OF FAST SHIP
PLANET B AT LAUNCH OF FAST SHIP
PLANET B AT LAUNCH OF SLOW SHIP

(Left) chemical propellants limit inter planetary flights to elliptical trajectories. By utilizing the velocities of departure and the gravitational attractions of the sun, flights paths for intercept with the arrival planet can be calculated. A fast ship utilizing continuous thrust could make almost a straight line intercept with the arrival planet.

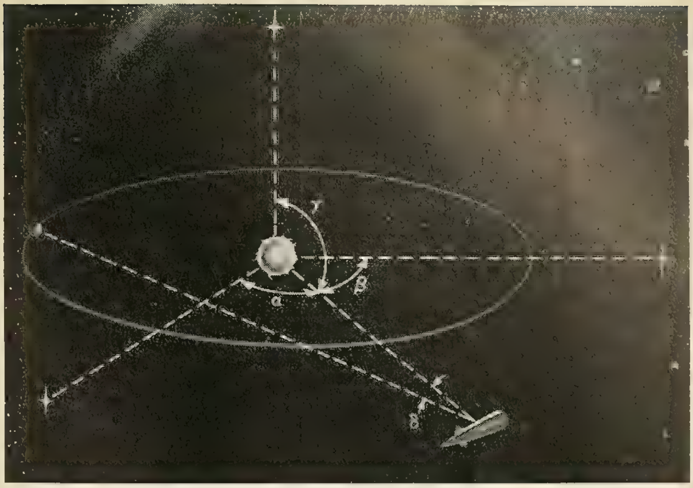


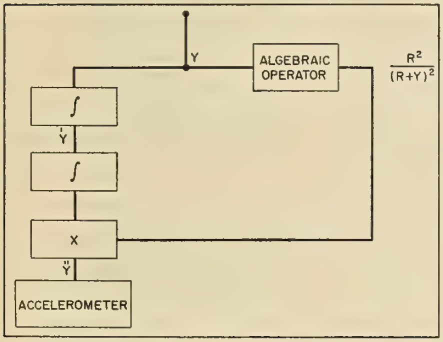
(Left) once a vehicle is in space, the problem of changing its course created complexities. To change direction of travel, (below) small rockets thrusting normal to the ship's horizontal axis are required.


V
θ
$a = \frac{\pi - \theta}{2}$
v
V_R

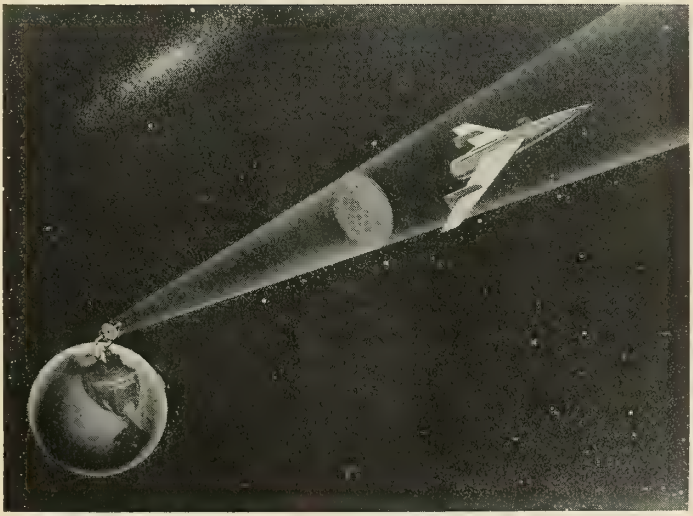
IF THE TRAJECTORY MUST BE DEFLECTED BY AN ANGLE θ, THE CORRECTING SPEED MUST BE $v = 2V \sin \theta/2$
THE CORRECTING THRUST MUST BE ORIENTED AT AN ANGLE $\frac{\pi - \theta}{2}$ TO THE INITIAL VELOCITY

Instantaneous knowledge of vehicle's position in space is of paramount importance to navigation. This must be achieved by Celestial Reference: sightings are made on three stellar bodies, in addition to the sun. An azimuth shot is then made of a planet in the earth's solar system to determine ships position with respect to the known positions of the sun and planet.

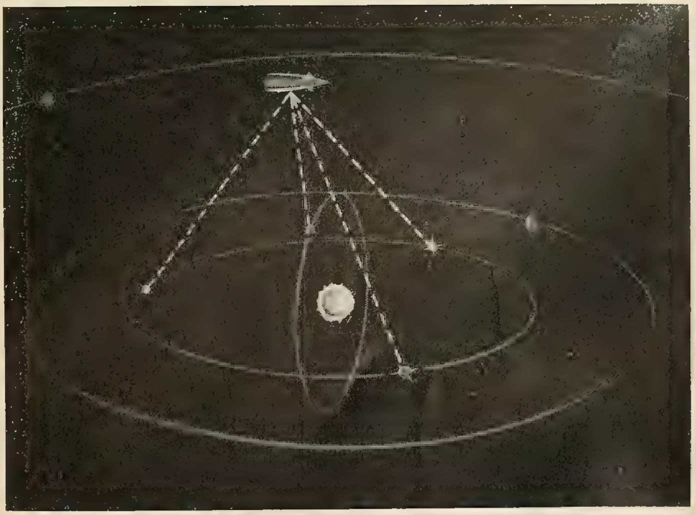




(Top) one method of navigation is through inertial guidance or IDR (Inertial Dead Reckoning). By integration of the output reading of an accelerometer, which in turn is fed into a computer, the velocity and the distance traveled is obtained.



A method of guidance (right, center) developed by Westinghouse Air Arms Division is referred to as the Cooperative Optical System or optical projection method. When on course the ship instruments will receive a "white" color signal. Any deviation from flight path will result in a color signal.



Radio satellites or more properly revolving planetoids orbiting about the sun would provide an accurate method of interplanetary guidance. Three of the planetoids would travel in one orbital plane with the fourth planetoid traveling in a plane as near 90° from the first plane as possible. Measurements of the distance of arrival of the planetoids signals with relation to space ship will provide a fix on the ship's position.

Military reliability in

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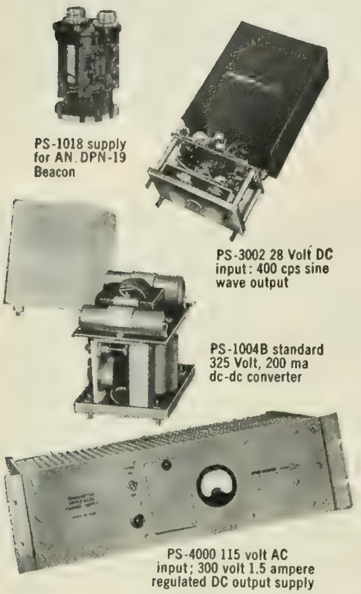
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Space Medicine

by **Hubertus Strughold, M.D., Ph.D.**

The fundamental purpose of studies in space cabin simulators, such as the seven-day test in February at the School of Aviation Medicine, is of a biotechnical and biomedical nature.

The biotechnical task is to test a sealed cabin, equipped with air-regenerating devices, as to its capability to keep a man alive and alert over a longer period of time. The biomedical side of the experiment includes the physiological study of the best kind of simulated, artificial atmosphere, the question of the best pattern of day-night cycle, and the psychology of isolation and confinement.

In the language of ecology and logistics, it is the aim of these studies to attain an optimum of comfort for the occupants, a maximum of efficiency of the air-regenerating and controlling devices, and a minimum of volume and weight. That not all conditions encountered in space flight can be simulated in such a ground-based simulator is generally well understood.

Komsomol Pravda has reported that Soviet scientists at a laboratory in Baboshkin near Moscow were developing a wing-flapping machine called an ornithopter, and that a demonstration of it had proven "unusual efficiency." The model craft has a 1-to-1½ horsepower engine and can lift 165 pounds. This would probably be about 180 English pounds.

This is interesting in the light of the long debate as to whether the human body—with its muscles as a power plant—could do that job, as first suggested by Leonardo da Vinci, and discussed by the physiologists Borelli in 1680 and Von Helmholtz in 1873.

To fly with his own muscle power, a man weighing 68 kilograms—with flight equipment weighing 108 kg—has to produce 2 horsepower. Under optimal machine technological conditions, the work could be decreased to about 1 horsepower.

But from studies in modern muscle physiology, we know that a strong man can produce only 15 mkg/sec or ⅕ horsepower for longer periods of time (higher output is possible for a very short time). A sprint runner may produce 5 horsepower. A race rower may produce 1.8 horsepower for 10 minutes. Long-distance runners and rowers can reach not more than 0.3 horsepower in one hour of work.

If we assume ⅕ horsepower as a possible maximum for a longer period of time, horizontal flights would require a 5 to 6 times higher energy output than a strong man can produce.

It might be possible, by improving the aerodynamic efficiency of a flapping-wing craft, to reduce the energy output required from 1 to ⅗ horsepower. In this case, short hops are conceivable.

In 1938 in Berlin, an aeronautical engineer demonstrated a wing-flapping device to me. For an explorer on Mars with reduced gravity (48%), and assuming the same air density and composition as on earth, it would be quite easy to fly around with musclepower. The Russian method attempts to replace the musclepower by a motor about six times as high in energy output than the musclepower of a strong man.

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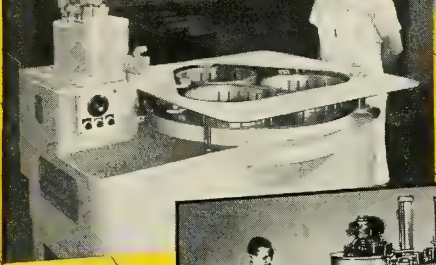

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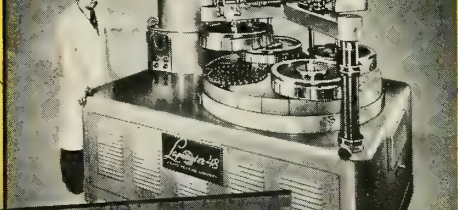
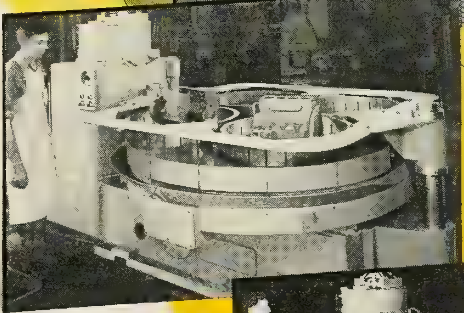
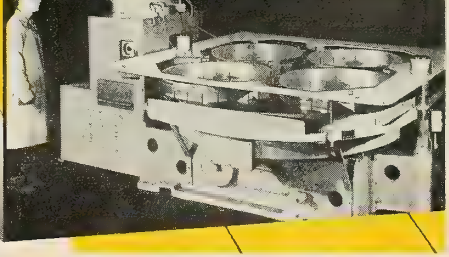


Model 48 handles 4 17-in. dia. parts up to 940 1-in. dia. parts per load.



Model 72 handles 4 27-in. dia. parts up to 2480 1-in. dia. parts per load.



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World Astronautics

by **Frederick C. Durant III**

The "Mars jars" at the USAF Department of Space Medicine (Randolph AFB, Tex.) are attracting increased interest. Samples of sandy soil from Arizona's Painted Desert are sealed in quart jars in an approximation of Mars' atmosphere. Atmospheric composition, humidity, surface temperature cycles, etc. are based on the best estimates of astronomers. First results indicate some microorganisms die quickly while others multiply easily under simulated Martian conditions. Related studies in the field, known as astrobiology, have been reported in French and Russian literature.

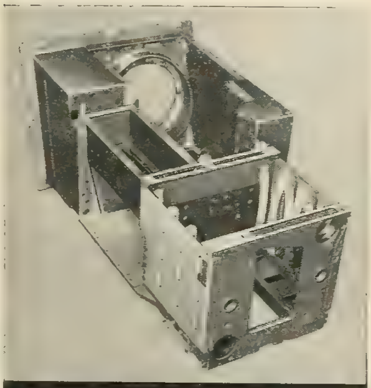
Readjustment problems—While intensive effort is underway to relate the capabilities and functions of "man on earth" with those of "man in space," Dr. Hubertus Strughold has suggested that another area of study will necessarily develop. This he terms "man back from space." Dr. Strughold pointed out recently that humans exposed for extended periods in a space capsule may find it difficult to readjust to terrestrial life. Once the physiological and psychological effects of weightlessness and "detachment" of space flight have become "normal," a period of time may be necessary for readjustment.

Another problem may be possibly dangerous strains of bacteria or viri indigenous to Mars which a terrestrial visitor might unwittingly bring back with him. This potential hazard will probably require quarantining upon return to earth. Dr. Strughold points out that such thinking is without practical application today. However, so was professional consideration of space medicine 10 years ago.

Updated—A few months ago an estimate was made in this column of the totalized period of weightlessness experienced by USAF pilot Maj. Herbert D. Stallings. The figures given were long out of date. Maj. Stallings told me recently that he had logged more than 37 hours of zero g during 4000 test flights in parabolic arc flight paths.

New light or speed of light—Those persons interested in relativistic effects of space vehicles traveling at speeds approaching the velocity of light should note a recent report from AFMDC at Holloman AFB, N. M. The paper, entitled "Relativistic Treatment of Rocket Kinematics and Propulsion" (No. AD-135004), examines reception and expulsion of particles including photons, in classical and relativistic cases. Optimization of a vehicle's final velocity is determined as a parametric function of available energy and final mass. Authors P. F. von Handel and H. Knothe conclude that exhust velocities must be increased 100,000 times to enable a vehicle to approach the velocity of light. Furthermore, the effect of relativistic time dilatation becomes noticeable only when traveling about 2/3 light velocity or more.

Surprising Accuracy—Because of its small size, it was anticipated that *Explorer* I might never be viewed optically. However, establishment of the orbit by the "microlock" telemetry system was so accurate that three U.S. Moonwatch teams made sightings within two days after launching.



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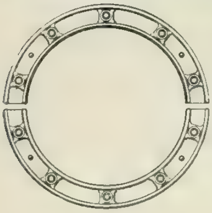
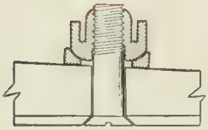
How ESNA® solves 7 typical aircraft fastening problems



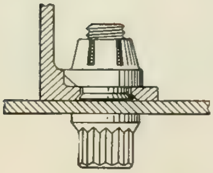
Speedier installation of access panels

ESNA gang channel nut strips eliminate the costly, time consuming installation job of riveting individual nuts. Available in straight or curved sections and even complete rings, custom designed for applications such as access doors or inspection covers.



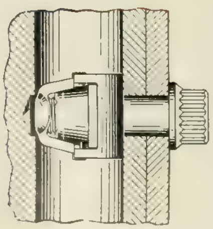
Bolting non-parallel surfaces

No more costly spot facing, step milling or hand selecting tapered shims! ESNA's counterbored, self-aligning types include one lug, two lug, gang channel, standard hex and high tensile types. Ball-and-socket relationship of nut and special base allow an 8° tilt in any direction from centerline to compensate for draft angle or tapered sections.



Fastening stressed joints subject to temperatures up to 1300°F.

For really "hot" applications such as jet engine flange assemblies or fire wall sections, where fastener dependability is critical, ESNA offers the "long-beam" locking device. The full cantilever of these sections assures protection against failures related to relaxation, creep and similar problems caused by the effects of extremely high temperatures upon metals. **(Ask for ESNA Bulletin No. 5715 Design Manual for High Temperature Self-Locking Nuts.)**



Simplifying major substructure joining

An ESNA barrel nut doesn't have to be held for wrenching . . . doesn't need precisely mated bolt holes. The barrel-shaped fastener, is simply finger-pressed into a drilled or reamed hole until the special clip snaps into position at the bolt hole location. The .030" float of the nut section of this fitting avoids misalignment problems and the bathtub recess for wrenching area is eliminated. New NAS 577 barrel nut (180,000 psi) now available. Also 160,000 and new 220,000 psi series.

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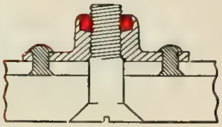
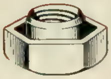


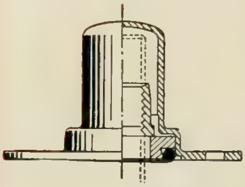
Applications requiring guaranteed high reusability through more than 50 on-off cycles.

Where repeated tear-down and re-assembly or frequent readjustment is required, the exceptional elastic "memory" and non-galling characteristics of ESNA's standard nylon locking insert guarantees long lasting locking torque and fastening dependability. Available in all sizes and configurations of standard aircraft type nuts. Parts can also be designed to order and in any standard configuration, with guaranteed re-use factors as high as 300 on-off cycles.



Attaching components in areas with limited wrench clearance.

Miniaturized insert-type hex nuts with across-the-flats dimensions as small as .109 in the 0-80 size . . . or all metal (550°F.) nuts to AN365 or NAS 679 performance specifications with internal wrenching hexagon faces (which permit use of smaller wrench sizes) are available for use at locations where space and weight limitations are paramount. Complete lines of NAS miniature anchor nuts in carbon steel and A286 stainless steel are also in production. **Ask for your copy of the NAS/ESNA Conversion Book.**



Sealing against fuel tank leakage

No danger of highly volatile fluids leaking past bolt threads with ESNA's self-sealing, floating anchor cap nut! The one piece cap unit is provided with "O"-ring seal around its base *which seals immediately the nut is riveted to the surface.* The self-locking nut enclosed within the cap has .025" float to compensate for misalignment. Also available in gang channel nut strips.

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- ☐ NAS/ESNA Conversion Book
- ☐ Bulletin No. 5715 High Temperature Design Manual

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Space Talk In Spotlight

Wayne W. Parrish discussing missile production problems with ex-Air Force Secretary Senator S. Symington.

A missile in the making? Rolls Royce Ltd. Board Chairman James Pearson, missile-maker D. W. Douglas and RR Assistant Chief Engineer Dave Huddie, at reception given for Douglas by m/r publisher Parrish.

Also at the Air Force Association's Jet Age Conference was Convair's Krafft Ehricke, here being questioned by m/r's Norman Baker.

m/r editor Erik Bergaust recalls old times with Polar pioneer and industry consultant Bernt Balchen at the recent Jet Age Conference held in Washington, D. C.

SHERATON PARK HOTEL

At AFA Jet Age Conference, Ballistic Missile Division Chief, Maj. Gen. Bernard A. Schriever, (center) is flanked l. to r. by ATLAS manager Col. Otto J. Glasser and TITAN boss Col. B. P. Blassingame.

. . . People

J. V. Naish has been elected president of Convair Division of General Dynamics Corp., succeeding **Gen. Joseph T. McNarney.** He formerly acted as executive vice president of the division and now becomes senior vice president of General Dynamics as well as president of Convair.

Whitley C. Collins, president and chief executive of Northrop Aircraft, Inc., has been elected a member of the Board of Trustees of the California Institute of Technology.

Dr. Alfred H. Williams has been elected to the board of directors of the International Resistance Co. Dr. Williams is currently chairman of trustees, University of Pennsylvania and previously was president of the Federal Reserve Bank of Philadelphia.

James Cox has been elected executive vice president and **Paul W. Booth** as vice president in charge of engineering at Hoffman Laboratories, Inc.

Dr. E. M. Baldwin has been appointed general manager of Fairchild Semiconductor Corp. He will also serve as vice president and member of the board of directors.

Lee S. Busch, technical director for Mallory-Sharon Metals Corp., has been reappointed to NACA's subcommittee on power plant materials.

Herbert Harris, Jr., has been appointed manager of Sperry Gyroscope Co.'s Air Arm Division. He formerly was chief engineer for the division. Simultaneously, **Edward M. Brown** was named treasurer of the firm.

Dr. George L. Haller has been elected a vice president of General Electric Co. Since 1956 he has served as general manager of GE's Defense Electronics Division.

Johannes G. Schaberg has joined Control Data Corp. as a staff engineer. He will have senior responsibility for the company's activities in missile guidance systems development.

Leonard K. Schwartz has been named a vice president of Hughes Tool Co. Since 1940, he has been with Lockheed Aircraft Corp. His specific duties with Hughes have not yet been announced.

Dr. James F. Jenkins, Jr., has been appointed director of development at Interstate Electronics Corp. He is responsible for direction of major projects involving missile test and evaluation instrumentation.

W. L. Smith has been named sales manager of Products Research Co.'s newly created Aviation Division, producer of sealants.

S. D. Heller has been appointed to the newly created post of vice president, Ballistic Missile Early Warning System of RCA Service Co. At the same time, **K. M. McLaren** assumes the post of vice president, missile test project, succeeding Heller.

Frederick Stevens has been named to head the electronic systems and equipment facility of Northrop Aircraft, Inc. and **Thomas H. Quayle** will head the firm's systems support facility, formerly designated Northrop-Anaheim.

Anthony J. Randazzo has been appointed manager of the Packard-Bell Electronics Corp.'s Rome, N. Y., office.

David M. Kyllonen has been appointed technical manager of the Muskogee, Okla., Division of Callery Chemical Co.

Major Bill R. Nash, formerly with Headquarters, ARDC, has joined the Washington firm of Thomas Wilcox Associates, consultants to the missile industry.

Ross F. Miller has been named chief engineer of Nortronics electronic systems & equipment elements.

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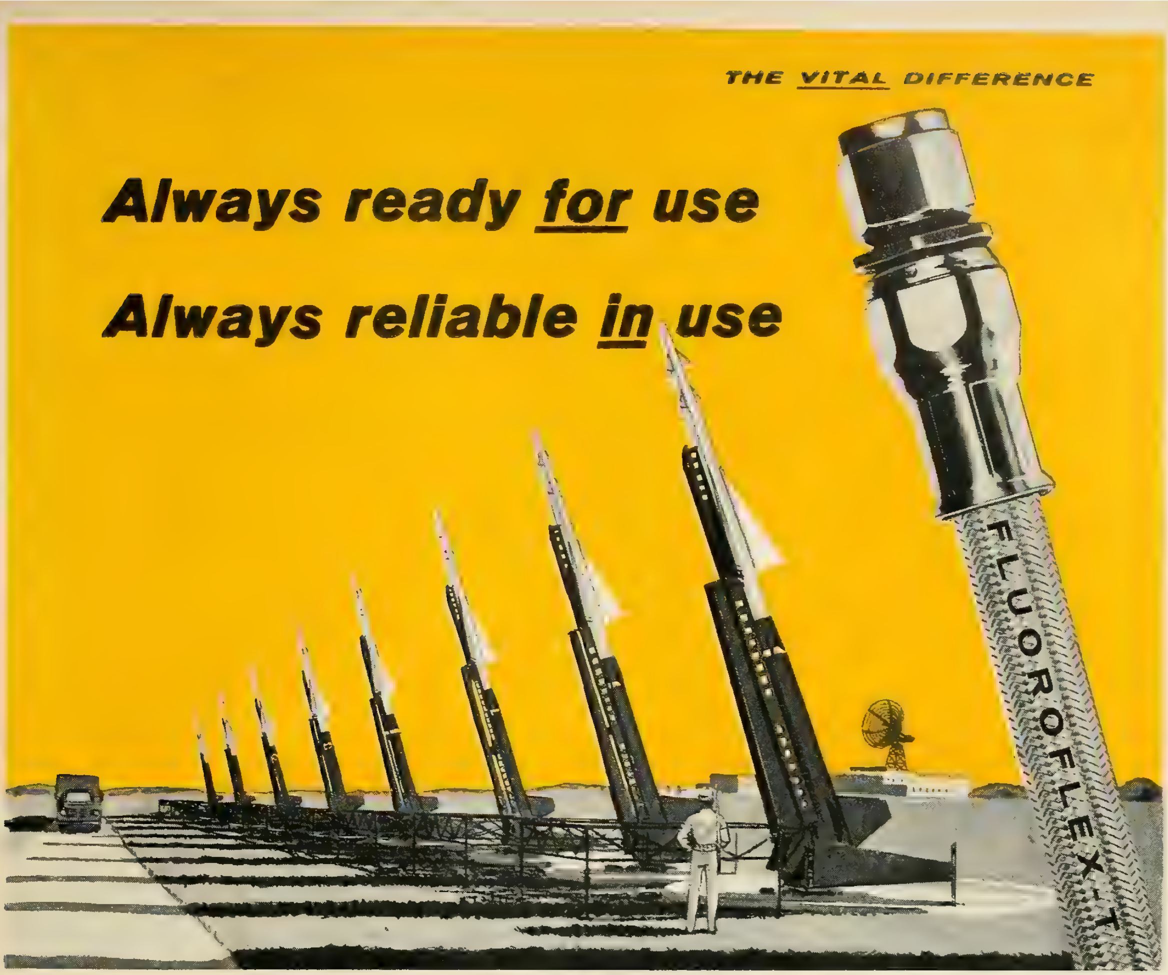

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This 64-page aircraft plumbing handbook gives detailed information on Fluoroflex-T hose and hose components. It's available on request.

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INTER-OFFICE MEMORANDUM

To Advertising Department Subject Recruitment Advertising for Engineers

From Vice President - Engineering

As the result of expanding activity in recent months, we have come up with a few openings for good engineers. Specifically, we need designers in the following product groups:

Pneumatic accessories
Electric motors
Fuel systems controls (pumps and valves)
Hytrol anti-skid braking system (electro-mechanical)

The requirements are not pressing: our present team can still carry the increased load. We're proud of the boys we now have, and it's important that we find exactly the right people to add to the group. Therefore, before you rush into print with the usual sort of "recruitment" advertising, here are some thoughts to use in formulating your message:

1. We don't hire engineers by the carload, and we don't stockpile them in reserve until the right project happens to come along. Our people are busy...very busy; and they like to be busy. They follow through on their ideas from inception to development and qualification. They feel a real responsibility for the hardware that finally results from their work. Therefore, we need more idea men with initiative and drive who are not afraid to get their hands dirty.

2. Don't write a lot of guff about "security" and "bright future." The kind of men we want carry their security around with them. They have the self-assurance that comes from ability and experience. Chances are they've known about our company for several years and have followed our progress in the industry. If they answer our ads, it means they like us - and they think they can help us to grow.

3. The kind of man we want will join us because we treat our engineers in the same way we treat our other key people. We don't isolate them and we don't put them on pedestals. We expect results; we know how to look for results; and we reward amply when we find them.

One other point: the man who meets our requirements is probably too busy to write a long resume and application letter. Just tell him to call me personally, or to drop me a short note to let me know where I can contact him - to Hydro-Aire, Inc., 3000 Winona Avenue, Burbank, California.
Phone: VIctoria 9-1331.

Frank Cooper
Vice President -
Engineering & Sales

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West Coast Industry

by Fred S. Hunter

Security costs money in the missile business. Lockheed's guard force for its California Aircraft division totals 150. The guard payroll at its missile systems division, already up to 200, is growing. Lockheed soon learned it needs two shifts of guards, even though only one shift is being worked. Seems the men who design and develop missile systems and missile components have the habit of working freely on their own time. This idiosyncrasy of showing up to work during nonworking hours requires added guard shifts to check 'em in and out.

"Mounties" in California—And, speaking of Lockheed's guards, would you believe that its missile systems division has a mounted force? Yep, on horseback. These mounted guards patrol the new 4000-acre Santa Cruz Mountains test site. This is a wooded area, so the guards double as rangers, spotting forest fires and the like. And in the hunting season they also keep a lookout for men with guns, who might venture into the area by mistake. Lockheed wouldn't want one of its missile experts mistaken for a deer.

Bright-eyed engineers at Radioplane have been using their coffee break and lunch time to theorize over a launching system that would send the grainstorage tanks of the nearby Budweiser brewery into outer space. Not only has their thinking reached the point where they believe it can be done, but a second group (equally bright-eyed) are certain they have a satisfactory recovery system devised. Naturally, it's called project *Hopnik.*

Boron into space: Kern County Land Co., rich old California cattle, oil and land organization, which recently made an investment in electronics, may also share in the new space age through its boron holdings. Reports put its Mojave Desert reserves at about 40 million tons. That would be the second largest known deposit of boron. U.S. Borax & Chemical reserves total about 100 million tons.

Reports around Los Angeles have it that North American Aviation definitely has submitted follow-on proposals on the X-15 to the Air Force to put an unmanned version into orbit, using the big three-barrel, 400,000-lb.–thrust rocket booster developed for the defunct *Navaho*, then a manned orbital version, and finally a piloted *X-15* to circle the moon and return.

Sample of the dynamic nature of the missile industry: Aerojet-General Corp. is a subsidiary of General Tire & Rubber, but not wholly owned. There's Aerojet stock currently selling around $300 a share in the over-the-counter market. As recently as 1954, it was selling for around $25 a share. Aerojet sales of $2.5 million in 1946 zoomed to $162 million in 1957, and that's a rate of climb equalling its own rockets.

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Contact force of 4 ounces per contact on 50 "G" models and 2 ounces per contact on 30 "G" models of "Diamond H" Series R and Series S miniature, hermetically sealed, aircraft type relays is one of the most important factors in their proven high reliability.

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In addition to contact force far beyond that found on other relays, "Diamond H" relays have greater contact cleanliness. Self-contamination is virtually eliminated by a completely inorganic switch mechanism, as well as use of coil materials which will not dust, flake or out-gas.

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For more information, write today for Bulletins R250 and S260. For quick facts about "Diamond H" switches, thermostats and other devices, ask also for a copy of the "Diamond H" Check List of Reliable Controls.

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Soviet Affairs

by Dr. Albert Parry

Russian researchers are cautiously talking of one interesting project of theirs: the use of lightning as a smiting weapon.

Creating artificial lightning, and adding it to the Red war arsenal as a weapon against enemy planes, is a novel Soviet idea. Experiments along this line are currently carried on in laboratories at Moscow and Leningrad.

The objective is ball or globe lightning, rarer than forked or zigzag and sheet or heat lightning.

In general, ball or globe lightning has not been as well understood as the other types, and has always intrigued Russian scientists. In the early 1940s scientist George Babat experimented with such lightning and finally succeeded in creating it artificially in the laboratory attached to the Leningrad *Svetlana* Plant.

Babat's work was continued by Professor Peter Kapitsa, one of Russia's foremost atomic-and-hydrogen, rocket-and-missile specialists, who in the 1950s took over Professor Babat's work and improved upon it with his own genius.

Kapitsa came up with his hypothesis as to the physical laws of the origin of natural ball lightning, and this hypothesis is considered by Soviet science to be a great step forward in creating and guiding artificial ball lightning.

Officially, the Soviets declare that they would use artificial lightning for peaceful uses only.

A Soviet technical writer, N. Dolgopolov, recently remarked that such lightning "would with extraordinary speed cut into the ground and form mining shafts with solid, streamlined walls," making Russian ore-mining a fabulously speedy and most economical process, and sure to cause a veritable revolution in the world's mining generally.

But unofficially, the Soviets are also considering ways and means of using artificial ball or globe lightning against enemy planes.

A team of Kapitsa's and Babat's students are now closely studying known cases of accidental "bull's-eye" hits of Soviet planes in flight by natural ball lightning, and they are drawing certain conclusions from this study. A case involving such a hit near Komsomolsk in the Soviet Far East in August 1956, when a Soviet air transport miraculously survived a bolt of globe lightning, is considered particularly fruitful.

More frankly—and with much authentic technical detail—the future possible use of artificial globe lightning against enemy airplanes is described in at least two works of Soviet science fiction.

Now, globe or ball lightning strikes men and their machines with a totally blind fury. But the Soviets want to harness this fury, to make it "see," to guide it as a truly terrifying, demoralizing, and shattering missile against definite targets—against whatever enemy faces the Soviets in the air in case of war.

Four new

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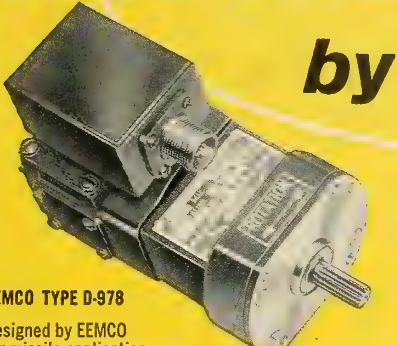
by EEMCO

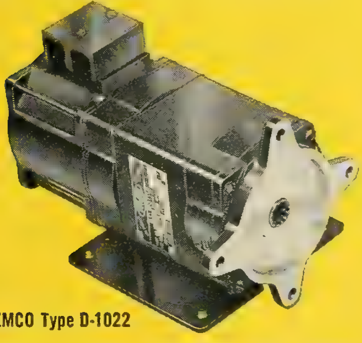


EEMCO TYPE D-978

Designed by EEMCO
for missile application
where prolonged testing is required under full load at a temperature range of +180° F. to +400° F.

SPECIFICATIONS: Volts: 27 volts DC (24 to 32 volt range). **Horsepower:** ¼ HP (⅔ HP max. short time overload). **R.P.M.:** 12,000. **Weight:** 2.75 pounds. **Miltary Specifications:** Radio noise filter meets MIL-I-6181B. Explosion proof requirement meets MIL-5272A-Proc. 2. **Altitude Operation:** Tested successfully at over 200,000 feet altitude. **Features:** Built for high shock and vibration loading.

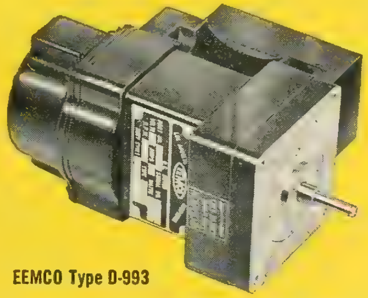
To design and produce motors for missiles that perform well beyond the limits of military specifications yet which maintain specified size and weight limitations is a constant objective at EEMCO. The design, development and testing of motors that achieve these extreme performance characteristics requires EEMCO to conduct company-financed independent research far beyond that normally conducted by a manufacturer of its size. In many instances EEMCO has been able to meet rigid specifications, in fact exceed them, when other producers have failed. For example, three of these extremely rugged new EEMCO motors illustrated will perform with reliability in the atmospheric conditions encountered at altitudes in excess of 200,000 feet, and they are built for unusually high shock and vibration loading. Please note the outstanding capabilities of the individual motors shown.



EEMCO Type D-1022

Designed by EEMCO for extremely high altitude operation with ambient temperature capacity to 165° F. Type D-1022 is capable of unusually high shock and vibration loading.

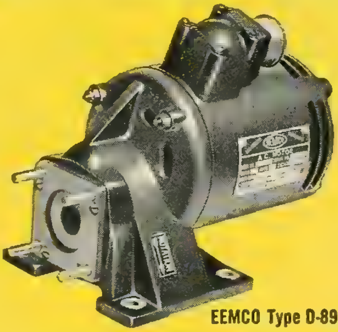
SPECIFICATIONS: Volts: 56 volts DC. **Horsepower:** 8.5 HP at 85% efficiency. **R.P.M.:** 12,000. **Duty cycle:** Two minutes. **Ambient temperature:** 165° F. **Weight:** 14.75 pounds. **Military Specifications:** Explosion proof requirement meets MIL-5272A-Proc. 2. **Features:** Built for high shock and vibration loading.



EEMCO Type D-993

Designed for missile applications where prolonged testing is necessary. Type D-993 will stand long idling periods with intermittent loads up to 1.25 HP. It is capable of withstanding vibrational accelerations of up to 125 "G's" in a frequency spectrum of 30 to 300 cycles per second.

SPECIFICATIONS: Volts: 28 volts DC (24 to 32 volt range). **Horsepower:** .65 HP. **R.P.M.:** 9600 RPM. **Weight:** 6.2 pounds. **Military Specifications:** Radio noise filter meets MIL-I-6181B. Explosion proof requirement meets MIL-5272A-Proc. 2. **Altitude Operation:** Tested successfully at over 200,000 feet altitude. **Features:** Built for high shock and vibration loading.



EEMCO Type D-899

Rated at 2.75 HP on continuous duty, EEMCO Type D-899 200-volt 400-cycle 3-phase motor is made with high temperature insulation allowing continuous operation at 3.5 HP or a correspondingly high ambient. D-899 contains an integral gear box.

SPECIFICATIONS: Volts: 200 volts, 400 cycle, 3-phase. **Load:** 2.75 HP continuous duty. **R.P.M.:** 3140 RPM. **Power Factor:** 83%. **Overall Efficiency:** 76% for entire unit including gear box. **Military Specifications:** Meets MIL-M-7969A (ASG). **Weight:** 11.25 pounds. **Features:** Type D-899 may be made splash- and drip-proof with minor alterations. Gear box, acting as motor support, places base at approximately the center of gravity of a motor-pump assembly thereby limiting extreme shocks and vibrations encountered in a missile.

EEMCO HAS DESIGNED and produced motors and actuators for missiles and aircraft exclusively for the past 15 years. It has made nothing else. Exhaustive research and testing aimed at perfection in the art of building these units has been a constant objective since EEMCO was founded. As a result, extreme precision and reliability has been attained in its products; therefore many of the latest missiles and aircraft being developed and manufactured for our Armed Forces today contain EEMCO motors and/or actuators.

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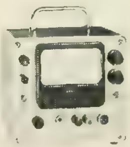

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Missile Age

by Norman L. Baker

Acceleration of future production schedules for the *Titan* ICBM, and a major step-up in development of the X-15 research rocket plane are two projects certain to be included in the Defense Department extra-spending package for fiscal year 1959.

The X-15 program is suffering propulsion headaches: The 60,000-lb-thrust rocket engine under development by Reaction Motors refuses to come up to design thrust. Meanwhile, the X-15 test schedule calls for first glide tests this fall and first powered flights in early spring '59.

The Defense Department spent $16.5 million on rocket test stands at the Holloman AFB Missile Development Center, then halted the project and gave the go-ahead to construct IRBM and ICBM static test stands from scratch at other locations. With the Air Force in an all-out effort to corner all the space projects, Missile Development Center officials are confident that the center must receive a large share of the business.

Project Rover, a Los Alamos study to determine the feasibility of using nuclear power to propel rockets, is still in the research and development stage. During studies so far, various concepts have been evolved, and some have been promising enough to justify incorporating into detailed design studies. First tests of reactor systems at the Nevada test site are now scheduled for late this year. Flight tests of rockets propelled by a nuclear system are not expected for about five years.

Nike Hercules missile defense system has been supplied a needed boost with the award of two contracts totaling $129,592,706 to Western Electric for production of an undisclosed number of the missiles and the related ground equipment. Douglas will produce the missile and some of the support equipment. Chief subcontractors are Consolidated Western Steel Co., which makes launchers; Goodyear Aircraft Co., which makes the boost engines, and Borg-Warner Co., which makes parts for the booster.

The Air Force is reported to be highly pleased with the recent test of the *Thor* equipped with a General Electric Mark I operational nose cone. Production of the extremely flattened cone is now under way at General Electric's Missiles and Ordnance Systems Department in Philadelphia. *Thor* is now in the payoff phase of testing and Air Force officials are confident that deliveries to operational squadrons will be made on schedule.

The Russians are in a crash program to develop a manned, hypersonic rocket bomber that cannot be brought down by an anti-missile missile. The rocket bomber is expected to be operational by the time the *Nike Zeus* is developed. The hypersonic bomber has considerable lattitude in attack techniques and therefore is almost invulnerable to a conventional anti-missile missile.

charting physical properties of the atmosphere

AiResearch Assembles Latest
Standard Information in Working Form

THE CHARTS on the following pages present the latest recognized standard properties of the earth's atmosphere. Based upon the best available data, and representing over a year of research, calculations, and careful rechecking, the charts were created by The Garrett Corporation's AiResearch Manufacturing Division, Los Angeles, under the supervision of Frederick H. Green, Assistant Chief of Preliminary Design. The work was closely coordinated with the Geophysics Research Directorate of the Air Force in order to obtain the latest information.

In 1942, AiResearch created its first Atmosphere Chart, which showed the then-known properties of the atmosphere up to about 65,000 ft. This was extended in 1945 to 80,000 ft, and in 1948 to 100,000 ft.

This year, AiResearch is issuing two charts, the Atmosphere Chart and the High Altitude Chart. The Atmosphere Chart covers the range from sea level to 100,000 ft, which is the basic operating region for current air-breathing aircraft. With the advent of the space age, we are starting to crowd ourselves out of this region into the realm of the High Altitude Chart, which goes up to 2 million ft.

Two original paintings by Chesley Bonestell, the dean of American space travel illustrators, form the backgrounds of the charts. These incorporate a high degree of pictorial accuracy in the portrayal of terrestrial features, sky, and the various vehicles by which man has progressed in his conquest of space. This progress is illustrated in numerous record flights including the recent records of Captain Iven Kincheloe at 126,000 ft in a rocket aircraft and Major Simons' balloon flight of 102,000 ft.

Atmosphere Chart

The Atmosphere Chart presents accurate values of temperature, pressure, and specific weight of the air for altitudes up to 100,000 ft. From sea level to 65,800 ft, the columns on the sides and the white temperature profile in the center of the chart are based on the ICAO Standard Atmosphere, established by the International Civil Aeronautics Organization and adopted by the National Advisory Committee for Aeronautics. Above 65,800 ft, the data in the columns and the dashed portion of the central profile are taken from the U.S. Extension to the ICAO Standard Atmosphere and the ARDC Model Atmosphere, 1956, which are in agreement. In addition to the Standard temperature profile, curves are shown for the Hot and Cold atmosphere temperatures and for the arctic and tropical profiles. The pressure and specific weight values shown are consistent only with the ICAO temperature profile, but are usable with the other four temperature profiles.

The ICAO Standard profile represents an average temperature for latitudes within the Temperate Zone of the northern hemisphere. The Hot and Cold temperature profiles, based on Military Standard MIL-STD-210A, represent extreme temperature criteria for the design of military equipment. They do not necessarily represent the absolute extremes observed; rather they are the values determined by scientific judgment not to be surpassed more than 10 per cent of the time during the most extreme month.

The arctic and tropical profiles provide criteria for consideration in problems dependent upon a hydrodynamically consistent homogeneous polar (arctic) or tropical atmosphere. These atmospheres cover extreme latitude zones in the northern hemisphere. The arctic atmosphere presents a mean day in the 60 to 90 degree North latitude zone and the tropical atmosphere presents a mean day in the 0 to 20 degree North latitude zone.

High Altitude Chart

The High Altitude Chart presents properties of the earth's atmosphere up to 2 million feet. In addition to extending the specific weight and pressure scales of the Atmosphere Chart, the High Altitude Chart contains values of geopotential altitude, acceleration of gravity, molecular weight, and real kinetic temperature.

The scales are readily interpreted with a moment's study, but the reader should note that the values of specific weight and pressure on this chart appear in terms of negative exponents and decrease as one reads up these scales. Thus the shorter black graduations are related to the longer division mark immediately *above,* and not below, them. For example, the pressure at 1,460,000 ft is 5 x 10^{-11} inches of mercury. Also, the geopotential altitude scale is plotted in black graduations, while the basic geometric altitude scale is plotted in white graduations and diamonds.

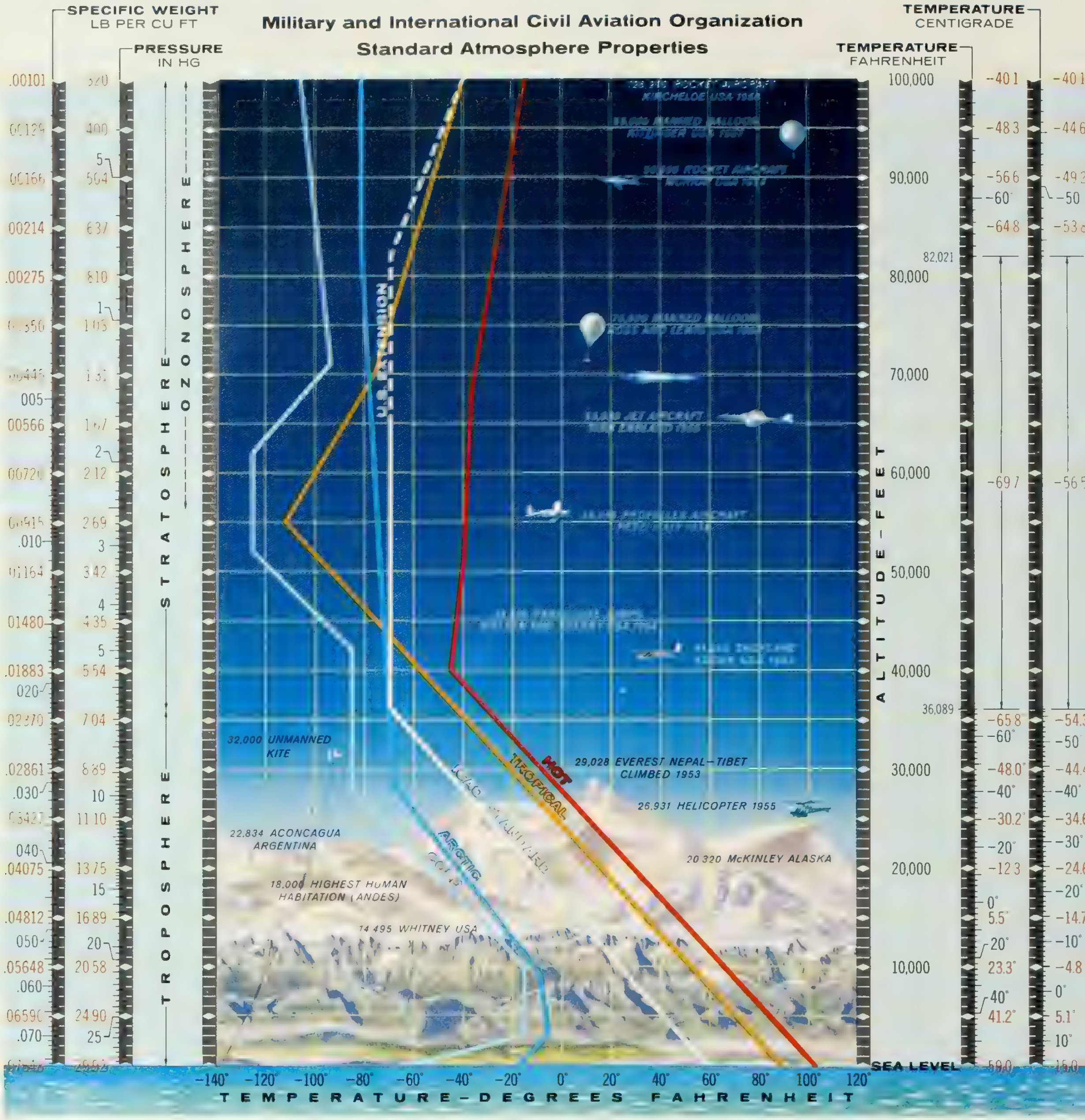
Real Kinetic Temperature

Real kinetic temperature, shown in the High Altitude Chart, is a measure of the kinetic energy of molecules and atoms constituting the atmosphere at any specified altitude. It is the appropriate temperature to be used in thermodynamic and fluid dynamic calculations, and is the same thing as the ambient

(continued)

ATMOSPHERE CHART

Military and International Civil Aviation Organization Standard Atmosphere Properties



This chart presents the latest recognized standard values of temperature, pressure and specific weight of the air for altitudes up to 100,000 feet. The pictorial inserts represent steps in man's achievement in learning to reach and to exist at high altitudes. From sea level to 65,800 feet the columns on the sides and the central profile all refer to the International Civil Aviation Organization Standard Atmosphere. The NACA Standard Atmosphere, 1955, and the ARDC Model Atmosphere, 1956, are consistent with the ICAO Standard Atmosphere up to 65,800 feet. Above that altitude the data in the columns and the dashed portion of the central profile are taken from the U. S. Extension to the ICAO Standard Atmosphere and the ARDC Model Atmosphere, 1956, which are in agreement. The pressure and specific weight values shown are consistent only with the Standard temperature profile. The hot and cold profiles represent U. S. Military extreme temperature criteria. The tropical and arctic profiles represent U. S. Military homogeneous atmospheres for the tropical and arctic regions.

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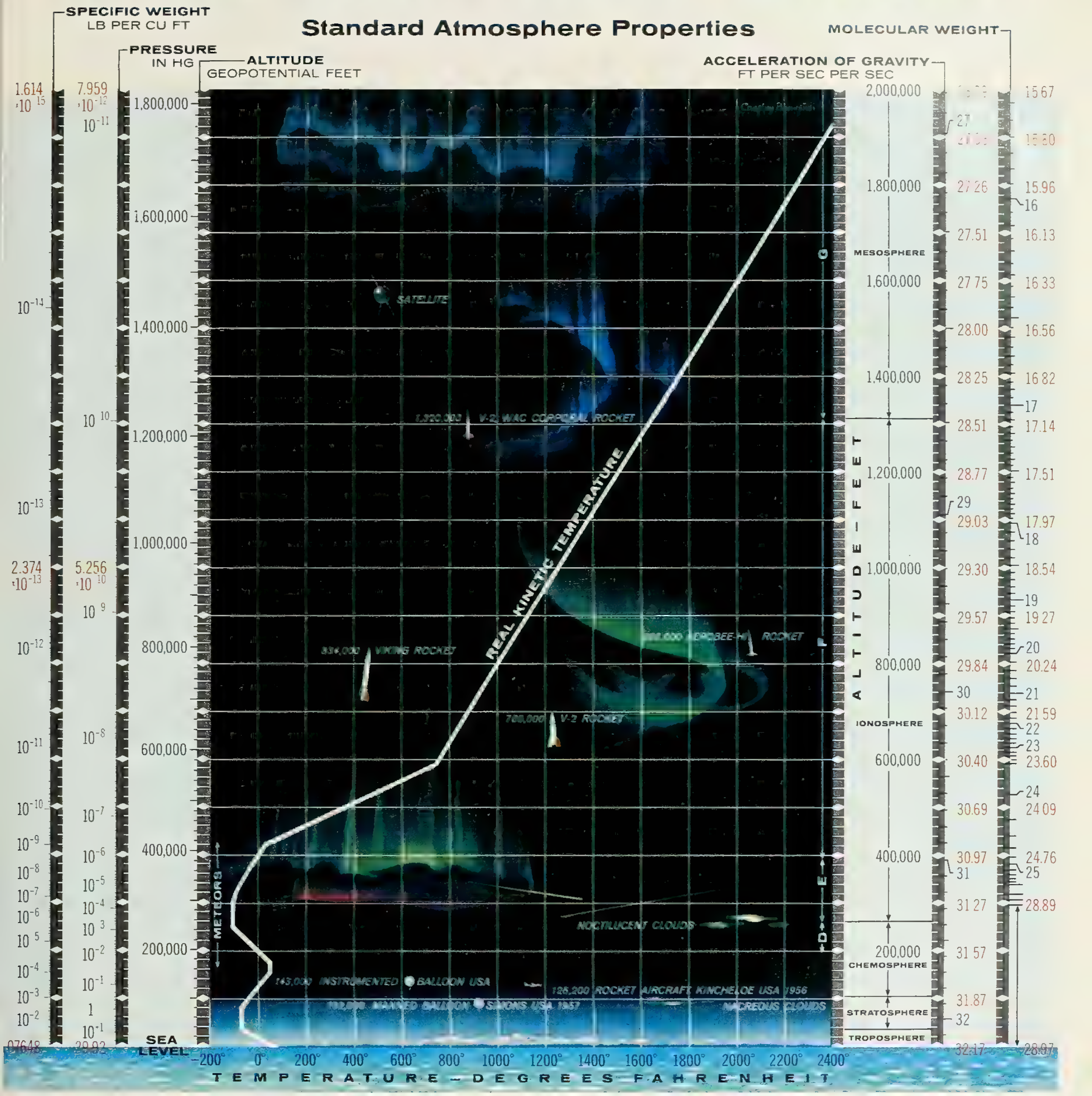
HIGH ALTITUDE CHART

Standard Atmosphere Properties



This chart presents standard values of temperature, pressure and specific weight of the air, based on the ARDC Model Atmosphere, 1956, for altitudes up to 1,780,465 feet. The altitude column on the right presents geometric altitude. The energy required to lift an object 2,000,000 geometric feet is only 1,824,988 times that required to lift it one foot above sea level, because of the decrease in the acceleration of gravity with altitude. This relative amount of energy is shown in the column on the left as geopotential altitude. Real kinetic temperature is a measure of the kinetic energy of the molecules and atoms constituting the atmosphere. Its numerical value is determined by the assumed molecular weight of air as well as the assumed temperature lapse rate. The molecular weight of air is assumed constant from sea level to 299,516 ft. Its decrease above 299,516 ft. to 590,401 ft. is attributed to the dissociation of oxygen; its decrease above 590,401 ft., to diffusive separation and dissociation of nitrogen. The symbols D, E, F and G refer to the respective ionized regions of the atmosphere.

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static temperature referred to in current aircraft design work and coincides with that of the standard atmosphere shown in the Atmosphere Chart.

It should perhaps be noted that readings from the temperature curves will not in general indicate the temperature of any body suspended in or through the atmosphere. Both aerodynamic heating and thermal radiation must be considered in calculating body temperatures. In particular, at high altitudes the few molecules of air near an object have little effect upon the object's temperature, compared with the heating effect of the sun's radiation. And were the object stationary and in shadow, shielded from the sun's rays as well as from other sources of radiated heat, its temperature would approach absolute zero, scarcely affected by the molecular action of the rarefied air.

Direct, independent measurements of temperature have been made only at relatively low altitudes, below 143,000 ft. Above that altitude, conventional instrumentation on sounding rockets yields only the ratio of temperature to molecular weight. Molecular weights have been measured only to about 300,000 ft so that "measured" temperatures extend no further. Above 300,000 ft the temperatures shown have been computed using assumed values of molecular weight based on the best available theory and experiments, together with values of the ratio of temperature to molecular weight as determined from rocket instruments up to about 1,000,000 ft, and from theory or other knowledge above this altitude.

In constructing the curves, standard variations of the ratio of temperature to molecular weight with geopotential altitude were assumed, consisting of a series of straight lines for various altitude regions. After applying the molecular weight functions described in the section below on "Molecular Weight" the result is a temperature curve which is also a series of straight lines up to about 300,000 ft but exhibits a definite curvature in the region just above 300,000 ft and again in the region above 600,000 ft. These curvatures are due to the abrupt changes in slope of the molecular weight curve described below.

Molecular Weight

Atmospheric composition at high altitudes is thought to vary considerably from that near sea level. The variation in composition may result from dissociation of various molecules of the atmosphere as well as from diffusive separation of molecules of various masses in a gravitational field. While several theories describing these phenomena exist, there are only a few data to support or disprove these theories.

At altitudes up to about 300,000 ft the molecular weight appears to remain approximately constant, and has been so assumed for the present chart. Between about 300,000 ft and 500,000 ft it is thought that the dissociation of O_2 is the principal factor in producing a change in molecular weight. Rocket measurements of O_2 concentration provide partial support to this contention. Diffusive separation and the dissociation of N_2 are thought to dominate the variation of molecular weight of the mixture of atmosphere gases above 600,000 ft.

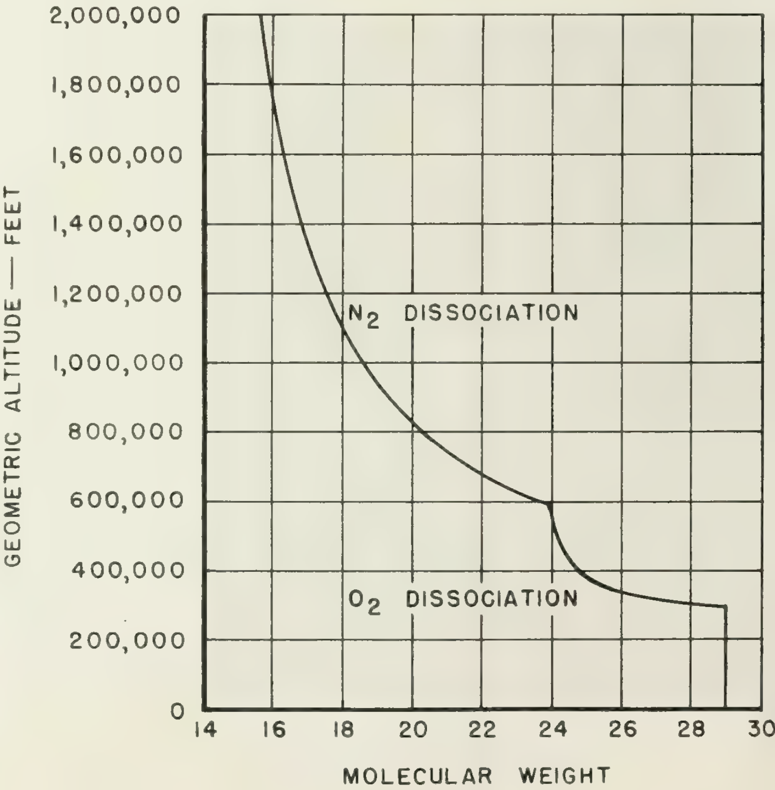
The Geophysics Research Directorate developed analytical functions in the form of two equilateral hyperbolas that are a reasonable approximation of the theories, assumptions, and data defining molecular weight. The figure shows a plot of the resulting molecular weight.

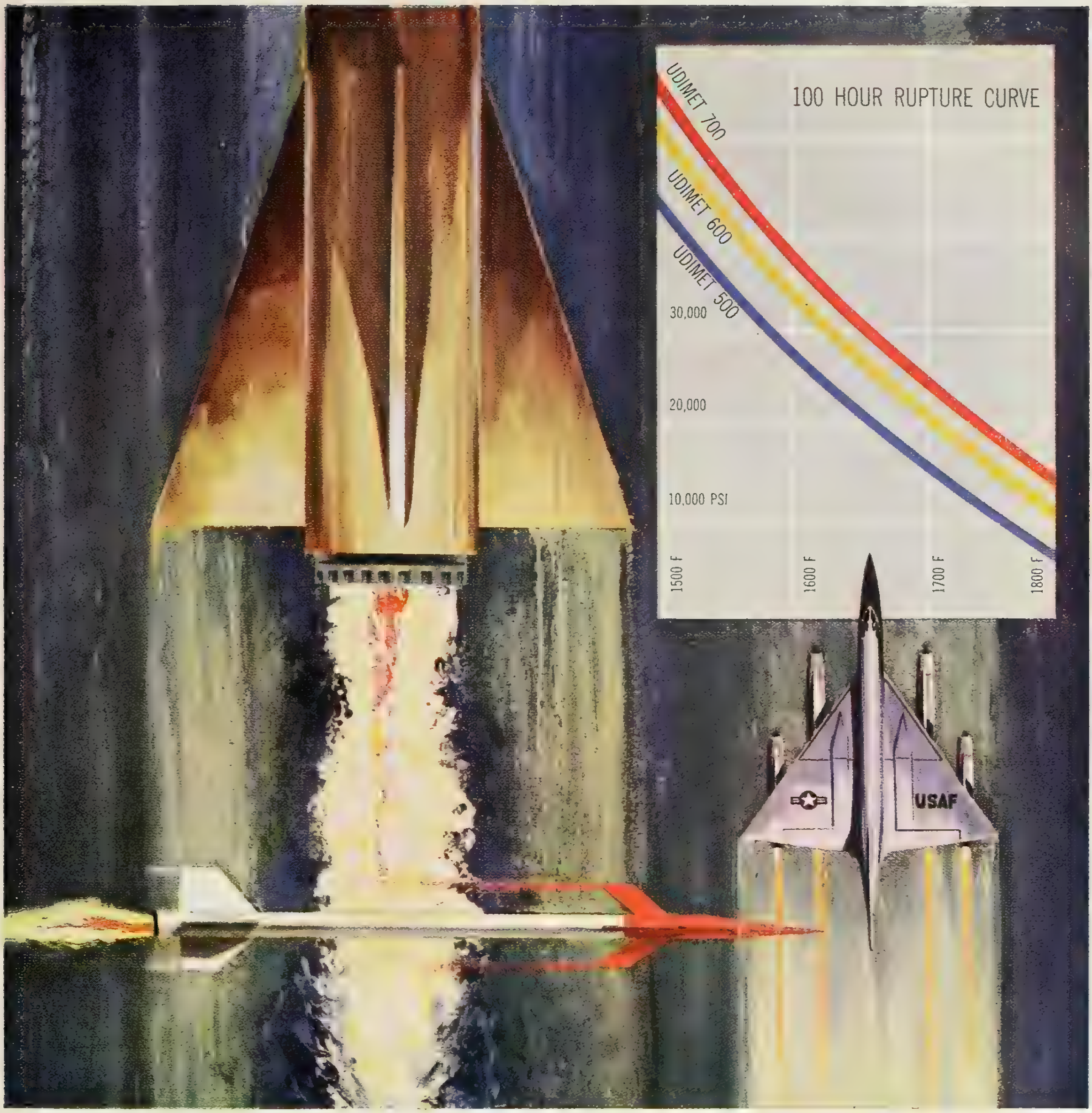
Geopotential Altitude

The concept of geopotential derives from the fact that the amount of energy required to lift an object decreases with altitude because the acceleration of gravity decreases with altitude. The geopotential of a point is defined as the increase in potential energy per unit mass lifted from mean sea level to that point against the force of gravity.

Geopotential altitude, which reflects the relative amount of energy required to lift an object to a given altitude, is a parameter involving both gravity and altitude and thus reduces by one the number of variables in equations relating the various atmospheric properties. This reduction in the number of variables comes without requiring the erroneous assumption of constant acceleration of gravity.

A unit of geopotential altitude is thus actually a measure of energy. It is very useful for certain atmospheric studies, but the geometric altitude was selected as the basic altitude function for these charts because of its clear physical meaning.





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IRE Switches From Recruiting To Sales

By Raymond M. Nolan and Peer Fossen

New York—The big show came to New York again this year, and with it came a change of emphasis—from recruiting to selling.

The recruiting effort of 1957—which caused many companies to shy away from this year's Institute of Radio Engineering convention, was largely absent.

Except for a few companies with heavy major missile programs, recruiting was confined to a search for experienced specialists. Company officials agreed that such talent is hard to come by, but that inducements besides salary—such as profit-sharing incentive plans—might be of some help.

One trouble is that most desirable men are already comfortably slotted in top spots with their present employers, and are loathe to leave, even for attractive incentive offers.

• **Missile shift reason?**—Many reasons have been advanced for the decline in recruiting activity, and, while some blame it on the current recession, most recruiters agreed that the shift in emphasis from aircraft to missiles has been the deciding factor.

With airframe activity lessening day by day, the era of the platoon system of engineering seems to be drawing to a close. In the small-to-medium-sized companies now prominent in the missile field, the emphasis is on individual quality rather than on mass "scatter" attack. This one factor, more than any other, means that enough basic engineering talent is on the market to fill industry needs.

However, this situation excludes companies with programs of such a nature that they cannot meet contractual requirements without substantial addition to staff.

• **More exhibits**—With the marked shift in emphasis to selling, the convention this year and more and better exhibits than ever before—over 950 exhibitors and something like 2½ miles of exhibits. Enough interest was generated to result in a waiting line at the New York Colosseum doors at opening time on the first day of the convention. Exhibits ranged from a full-sized 28-foot diameter parabolic antenna to a pinball machine which impacted a klystron tube with High-G shock when players hit the right bumper.

Most significant fact about the various exhibits was the selling effort connected with them. Attendees were able to ask questions about either technical or money matters and get answers from teams manning the booths. As one exhibitor put it: "We're selling hardware, not buying bodies."

Gossip at the sessions ranged from the question of who would be the prime contractor on the Navy's projected *Subroc* program, to who had the fanciest digital read-out device. In this latter category, viewers were confronted with some of the most spectacular electronic equipment in existence today. Automatic read-outs displayed ranged from electronic adding devices, complete with plus signs, to fast-cycling counters with hundreds of individual read-out tubes.

• **Trend to missiles**—Very significant was the trend away from aircraft orientation and toward missiles.

This was strongly indicated by the most important meeting of the convention—the Tuesday night session on the Waldorf-Astoria's Starlight Roof. Its theme: Electronics in space.

Participants were E. Stuhlinger, of the Army Ballistic Missile Agency; C. S. Draper, of Massachusetts Institute of Technology; Maj. D. G. Simons, of the Air Force; J. B. Wiesner of MIT, and F. L. Whipple, of the Smithsonian Astrophysical Observatory.

Their discussion concerned the evolution from existing concepts to the role of electronics in space—not only that, but electronics for defense and for war.

The round-table which included these scientists discussed informally the use of electronics for propulsion, navigation, communications, telemetry and instrumentation. The basic question raised was: what new areas must be anticipated for existence inspace at blast-off, en route and in the terminal environment.

Much discussion throughout the convention concerned the subject of reliability. Panelists and audience could go back three or four years to a time when this concept did not exist, but all concerned realized that reliability is the hinge on which all developmental work swings.

Alfred R. Gray, of The Martin Co., Orlando, pointed out that the "statistical cliche" cast no reflection on the general subject of reliability. However, he emphasized that he has no quarrel with those reliability engineers who have constantly stated that the theoretical relationship between component-part reliability, complexity and weapon-system reliability are so important in the overall weapon system field.

He indicated that there has been a pendulum swing, during the last three years, from a relatively uncontrolled reliability to a type of reliability effort using "too many chiefs and too few Indians."

One of the more interesting papers presented concerned radar antennas capable of detecting enemy missiles up to 3000 miles.

Devices to sense signals in the 3000 miles range would normally be large and unwieldy, and therefore difficult to sweep back and forth. However, the antenna described by engineers of Westinghouse Electric Corp. solve this problem by cycling the beam electrically while the antenna remain fixed.

This is particularly important on stations such as the northern DEW line and the Texas Tower picket line where high winds are normal weather conditions.

The general consensus of delegates was that the IRE has finally swung away from a promotional operation designed to recruit large numbers of engineers into a real trade convention—one which has the primary purpose of selling the products manufactured by the exhibitors.

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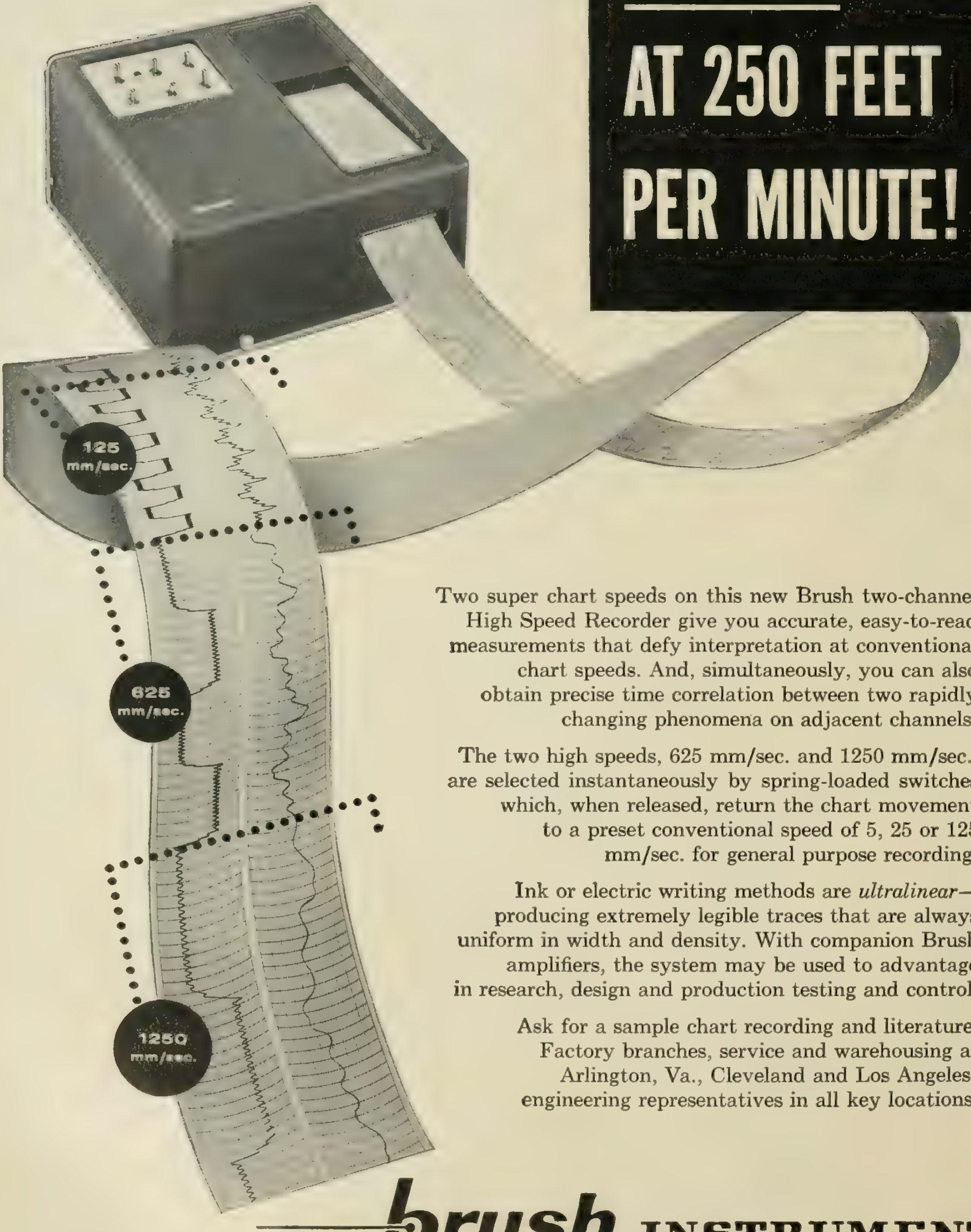

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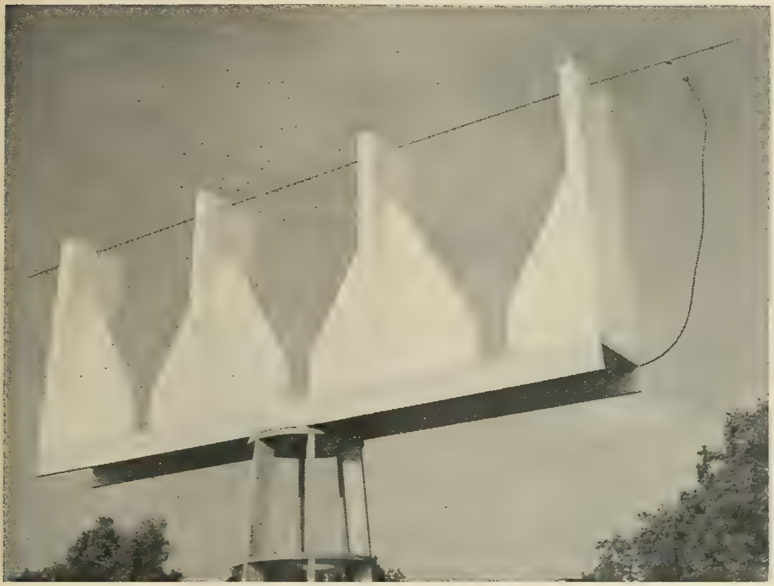


Antenna Design Aims At Sensitivity

The ever-growing application of electromagnetic waves for communication, navigation and detection has served to intensify antenna research activities. Main research objectives: greater efficiency and reliability, lower initial cost, reduced maintenance expenditures and simplicity.

The search for newer and better antennas has resulted in strangely shaped structures and monstrous configurations that are a far cry from the early straight-wire aerial.

Stanford Research Institute is currently experimenting with an entirely new antenna concept designed to meet the need for more sensitive point-to-point radio and TV communication in the vhf-uhf (30 to 3000 mc/s) range. A short segment of this antenna is similar to the common parallel rod Yagi TV antenna, but the overall design differs in that the cross rods are displaced in a spiral around the axis which is considerably longer than that of the Yagi.

Extending the length is desirable, since the signal-amplifying ability of an antenna normally increases in proportion to increases in its length. In the case of the conventional Yagi, however, there is a practical limit beyond which added length yields very little increase in signal intensity. The new spiral arrangement of the rods is expected to overcome this limitation and enable the full advantage of a long axis.

The experimental model in the accompanying photo has a physical length of 10 feet and the plane of the cross rods makes a complete (360°) twist over the length of the axis. Antennas of many times this length are expected to be used advantageously in installations which would normally require expensive paraboloids. Indications are that the gain of a twist antenna 50 wavelengths long would be about 25 to 26 decibels.

A second SRI project involves a parabolic segment antenna designed for research use in Alaska in conjunction with a large dish-type antenna to study the aurora. The large "dish" transmits 400-mc/s signals which are reflected by the aurora and picked up by the parabolic segment antenna located approximately 50 miles away. Data obtained from the received aurora-modified signals are being used to study the characteristics of the aurora.

SRI is also conducting a series of tests at the Radio Propagation Field site to study moon and meteor "echoes." A broadside Yagi array is being utilized in conjunction with a large dish antenna. 100-mc/s signals are beamed from the large dish to the moon where they are reflected to the broadside Yagi. The returning signals provide data about the moon's surface as well as about the upper atmosphere. Other studies are being made of the way signals are reflected from meteors.

Electronics Spending Continues Rise

Department of Defense spending for missile electronics over the first half of FY 1958 totaled $572 million according to Electronics Industries Association's second quarter report. The report indicates the amount for the second quarter to be $299 million, or $26 million more than reported for the first quarter. The combined military spending for electronics over the first half of FY 1958 amounted to $1,893.5 billion, while the total for calendar 1957 reached an all-time high of $3.9 billion.

Intended primarily to depict trends, and subject to later revision, the EIA computation shows the following missile electronics figures (in $ million) for the first and second quarters for fiscal years 1957 and 1958:

1st Quarter FY 1958	*2nd Quarter FY 1958*	*1st Quarter FY 1957*	*2nd Quarter FY 1957*
$273	$299.0	$205	$259

Total electronics spending for same period was:

Budget Category:				
Aircraft:	340	346.0	213	270
Ships & Harbor craft	23	25.0	17	19
Combat vehicles.	1	–.2	2	2
Support vehicles	1	.7	..	1
Missiles	273	299.0	205	259
Elec. & Comm.	204	214.0	130	236
Research & Dev.	73	74.0	65	76
Miscellaneous ..	11	9.0	5	13
	926	967.5	637	876

For further comparison, see m/r February 1958, page 75.

Missile Warning System Under Study Two Years

Arthur L. Malcarney, executive vice president of RCA Defense Electronic Products, recently revealed that award of a missile-warning system contract by the Air Force to RCA had been preceded by a company-financed program of research into the area.

"A warning system against possible ballistic-missile attack is not a new problem to us," Mr. Malcarney said. "Utilizing our own resources, we have been studying the situation for more than two years."

The new warning system will be installed at top-secret locations where long-range radar will be utilized to seek out and pinpoint any ballistic missile firings with hostile intent. The connecting radar outposts will feed the information to a centrally located brain center in the United States.

Computers "Fire" Rockets in Tests

Machines cut actual launching need to minimum

by Peer Fossen

WHEN THE WHITE SANDS Proving Ground in New Mexico was established shortly after World War II to study captured V-2 rockets, America's military men believed the only sure way to test a missile was to fire it and then watch it closely.

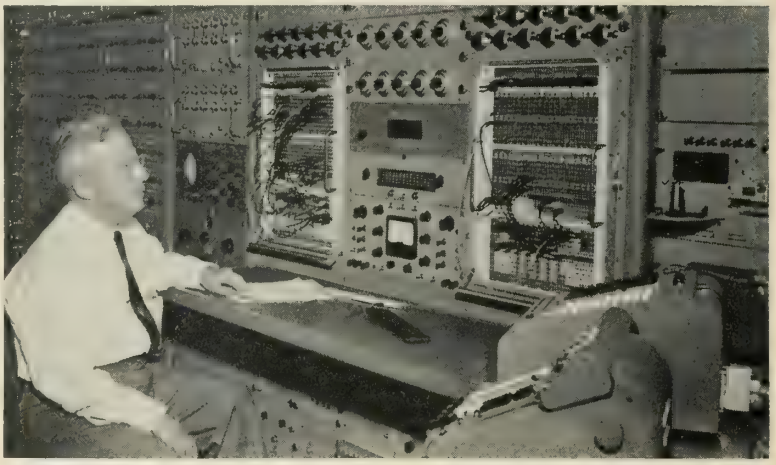
As experience was gained in this new field, the concept changed drastically, and today, the military is obtaining as much valuable scientific information by "mock" firings in the two-year-old Flight Simulation Laboratory as from actual range launchings. Scientists working in the laboratory are saving the country's taxpayers millions of dollars each month.

Although flight simulation is still in its infancy, its fantastic growth in this short span has prompted the need for better working quarters. A large new building with increased facilities is planned for next year, to meet this need.

Simulated missile performance is nothing new in scientific circles. V-2 scientist Guenther Hintze carried out "mock" launchings on a somewhat smaller scale in Germany toward the end of World War II. The efforts were rather limited due to inadequate equipment and the newness of computer technology. Actual missile components were at that time tested on tilting tables in the laboratory at the Peenemunde base.

Hintze, who came to WSPG with other German missile experts in 1946, today spearheads the work here as chief of the Flight Simulation Laboratory. Since setting up simultation at WSPG he has perfected the system to the point where no component of the missile is required for the "mock" testing in the laboratory, a desired improvement.

The flights are simulated mathematically by giant computers, reducing actual missile launchings appreciably. The data collected through the laboratory tests rarely varies more than two to five percent from those obtained through actual launchings, a very low variation.



GERMAN-BORN scientist Guenther Hintze prepares an analog computer to "fire" a missile at WSPG's Flight Simulation Laboratory.

Everything about the missile, and the many variables that might influence its flight behavior, are expressed in mathematical equations. These equations reflect such variables as the missile's weight, size, velocity and thrust, as well as data on atmospheric conditions that might affect the simulated missile flight.

The equations are fed into computing machines to set up the firing problem. Setting up a master problem might cost from $5000 to $10,000, but this is a small sum considering the multitude of test flights that will arise out of one problem. A slight change in one variable will create a completely new flight.

In comparison, a live test firing of even the most inexpensive American missile will cost $100,000 or more.

Two types of computing machines are used for the tests, digital and analog. The digital machine ejects its information in the form of numbers while the analog computer expresses its answers in voltages which are later plotted on graphs.

The "mock" firings at the laboratory far outnumber the live launchings on this integrated range shared by the Army, Navy, Air Force, and Marines. The value of the simulation program, says Guenther Hintze, can be summed up in these three major points:

1) Range safety—Simulated firings indicate whether a planned range firing would overleap the safety boundries, proving a trajectory in advance of actual launching.
2) Savings—The laboratory firings are inexpensive as compared to live launchings.
3) Flexibility of flight patterns—Flights can be planned in the laboratory down to the smallest detail. It is always possible to back up and start over again with a minimum of time, effort and cost.

In spite of the essential role simulation plays in missile development and testing, there is a limit to the kind of information and data it can yield. The final answers to missile-performance speculations and problems must come from the real firing. But simulated firings such as these will make the task easier.★

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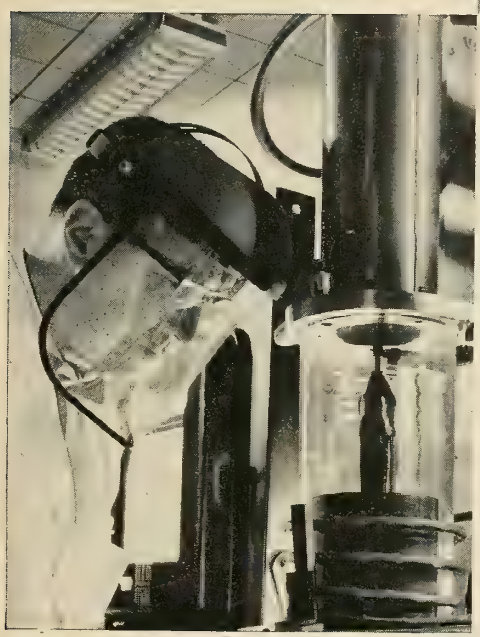

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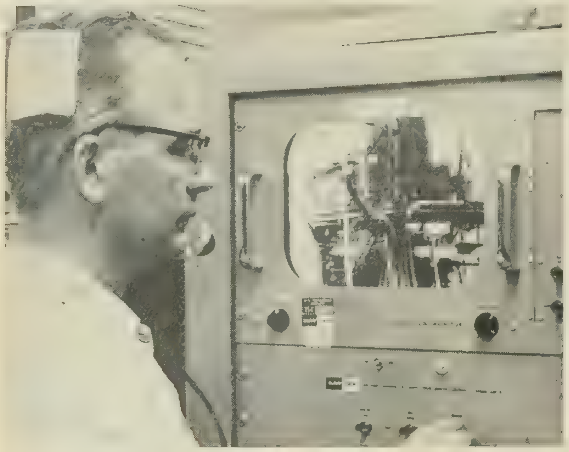
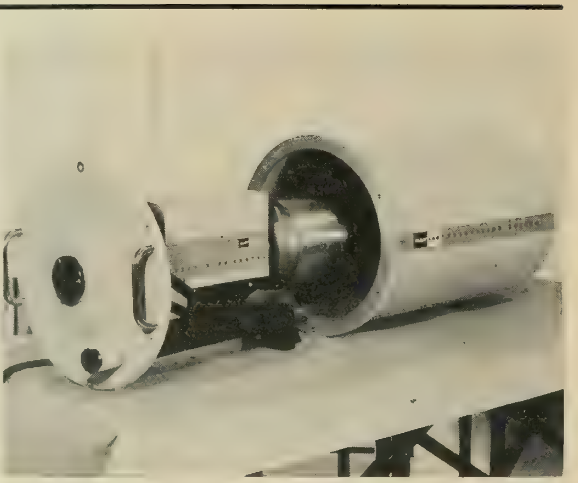


SIZE COMPARISON. Package on right is one of several proposed for uses other than satellite.



NUMBER OF MERCURY cells needed for 500 milliwatt transmitter (on left) and number of similar cells needed for new transmitter.

Reduced-Size Satellite Transmitters Coming

by Raymond M. Nolan

Now that the United States has succeeded in launching satellites of both the *Explorer* and *Vanguard* types, attention has shifted from the launching to the satellite payload. This has thrust the satellite transmitter and its associated power pack into the spotlight as a really critical element.

Research along the lines of ultra-miniaturized transmitters and smaller power packs by the Naval Research Laboratory and the DuKane Corp. of St. Charles, Ill. has resulted in a design which should play an important part in future orbiting payloads and also in moon-orbiting or impact payloads.

The new transmitter, which should allow broadcasting from two to four times as long as present satellite units, is a 500 milliwatt version of NRL's 100 milliwatt satellite transmitter. It is crystal controlled and employs three recently developed Western Electric transistors capable of operating as oscillators or amplifiers at 108 mc/s, the IGY satellite frequency.

The special circuits developed for the transmitter give much greater overall efficiency than is now possible with vacuum tubes. In fact, a tube transmitter developed for the same purpose requires five times the battery voltage and five times the battery power needed by the new transistorized unit. In reference to satellite use, this means a highly significant saving in weight, since fewer batteries can do the same amount of work. Or, using the same batteries, the satellite transmitter can broadcast for a longer period of time.

This particular transmitter, described by Michael Supitilov, DuKane Research Director, as a "new combination of known components," is designed primarily for use in the satellite program. Its broadcast signals would be used in telemetering information on space conditions to monitor stations throughout the world, and as an aid in tracking the satellite's path.

The tiny unit weights less than three ounces, and occupies less than six cubic inches of space (a pack of cigarettes occupies about seven cubic inches). For a power output of 500 milliwatts, it uses one-half to one-fourth the battery power needed by any other transmitter now known.

Typically, the output stage of a conventional tube-type transmitter doing the same job would need 4620 milliwatts input power to produce 500 milliwatts output. By contrast, the output stage of the new transmitter needs only 930 milliwatts power to produce the same output. The corresponding efficiencies are 11 percent and 54 percent.

As an additional advantage, the unit operates on a single 20-to-24 volt battery, whereas a tube-type transmitter requires both low-voltage filament and high-voltage plate supplies.

Tubes also generate, and the heat must be dissipated, a problem which crops up often in miniaturization. The transistor circuit greatly reduces this problem. Simplified circuitry and re-

Comparison of DuKane's 108 Megacycle Satellite Transmitters

Stage Characteristics at 500 Milliwatt Output

	Tube Type	New Transistor Type
Collector Voltage	....	20 volts
Collector Current (pair)	....	45 milliamps
Collector Circuit Input Power	....	900 milliwatts
Collector Circuit Efficiency	....	58%
Emitter Power Input	....	30 milliwatts
Plate Circuit	120 c. @32 ma.	....
Screen Circuit	120 v.@5 ma.	....
Filaments	2.25 v.@80 ma.	....
Total Input Power to Final Stage	4620 milliwatts	930 milliwatts
Overall Final Efficiency	10.8%	53.8%

duced shielding problems because of low operating impedances also make it possible to squeeze an amazing amount of transmitting power into an extremely small space.

The transmitter can be operated on solar batteries, drawing its power from the sun and sending out its signals indefinitely, but with one-half to one-fourth of the solar surface heretofore required for exposure.

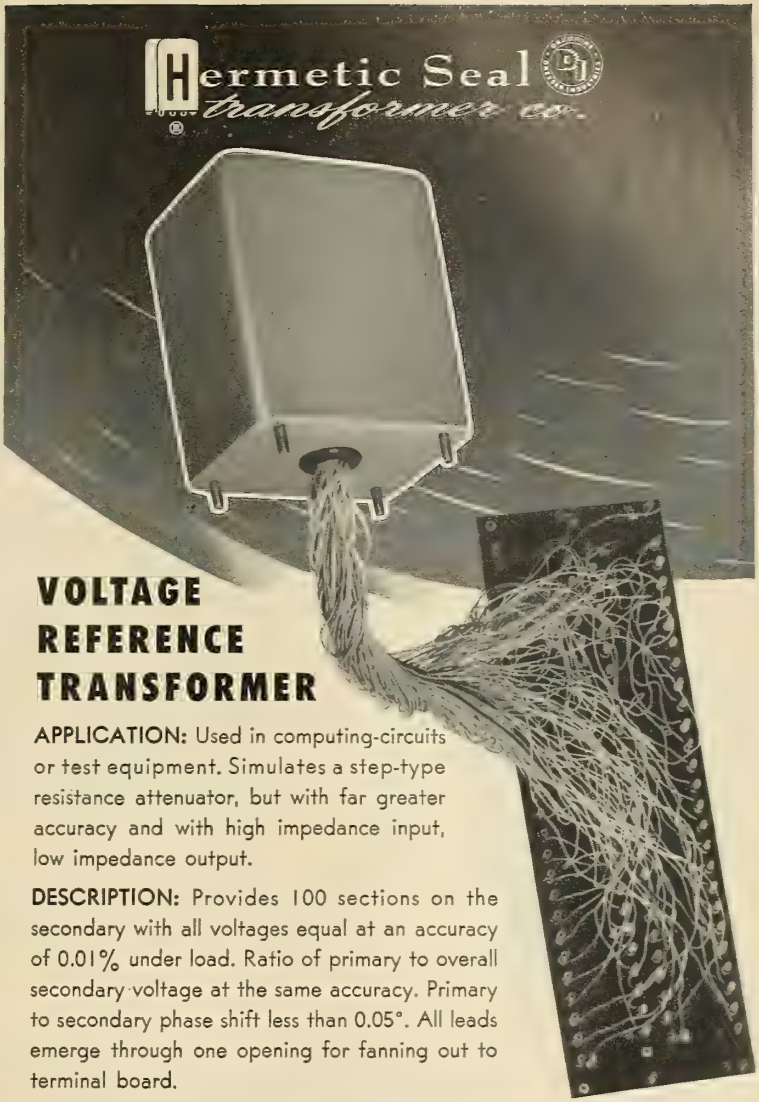
A comparison of the operating efficiencies of the new circuit and a typical tube-type circuit is given in the box.★

Westinghouse Develops New Missile Gyro

Westinghouse Electric Corp.'s Air Arm Division recently announced the development of a new subminiature rate integrating gyro for missile guidance and airborne armament control systems. The new design designated as SIR-1 (subminiature integrating rate) gyro Model No. 1, incorporates manufacturing techniques which make possible a cost reduction of as much as 50 percent over comparable gyros.

Main design objectives are: (1) simplified construction of both the moving coil and the magnet stator of the torque assembly; (2) ease of initial alignment and simplicity in fabrication of the signal generator; and (3) use of solid stator for the spin motor, eliminating manufacturing operations necessary with conventional laminated assemblies.

The following performance characteristics have been released by West-



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Range—plus or minus 120° per second;

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Linearity—within 0.1 per cent of maximum value;

Mass Unbalance of Gimbal—0.3 dyne-centimeter;

Dimensions—length, 3 inches; maximum diameter, 1½ inches at mounting ring;

Weight—7 ounces;

Angular Momentum—3000 dyne-centimeter seconds;

Viscous Damping—3000 dyne-centimeter/radian/second.

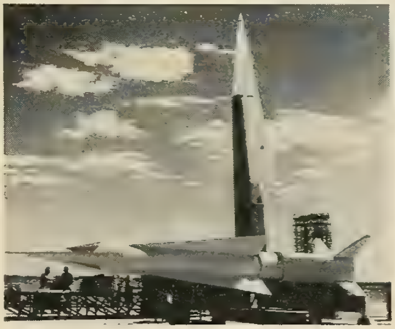
Other features of this development include: (1) a d'Arsonval torque generator for linearity of command and absence of residual torques; (2) a new signal generator for linear measurement of gimbal angle and the absence of residual torques; (3) jewel gimbal bearings for minimum friction; (4) a continuous temperature-controlled fluid damper for a constant damping factor; (5) a full-floated gimbal assembly to insure resistance to the effects of shock and vibration, and to insure low friction at the gimbal bearings; and (6) a high-torque spin motor capable of reaching synchronous speed of 12,000 rpm in four seconds.

Several development models and a preproduction prototype of the unit have been completed.

ICBM Detection Rig Transmits High Power

Cornell Aeronautical Laboratories and the Army have revealed what is considered an important advance in development of ICBM detection devices. An ICBM, because of its extreme speed and unusual configuration, is difficult to detect with present-day radar equipment. Therefore, any radar contemplated for anti-missile use must have a great deal more power than a corresponding radar used in aircraft detection.

CAL, working on the project under an Army Ordnance research contract applicable to Army missile systems, designed the high-peak-power microwave equipment. Using a special microwave generator, the laboratory has transmitted radar-like signals at a peak power of 21 million watts. This power output is many times more powerful than heretofore believed possible, and is believed to be the largest peak power ever radiated.



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With component reliability getting increased attention from missile and aircraft designers, it is significant to note the number of supersonic weapon systems equipped with Genisco accelerometers.

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1.12-1.70	L	RG-69/U	RXB103085		10°E	D.C	250	130	15.2
			TD-21	6881	90°H	D.C.	250	65	15.2
			TD-29	7101	90°H	A.C. and D.C.	250	130	18.0
			TD-33		90°H	A.C. and D.C.	250	75	15.2
2.6-3.95	S	RG-48/U	TD-12	6358	10°E	D.C	250	80	15.2
			TD-22	6782	90°H	A.C and D.C	250	45	15.2
			TD-31		10°E	A C and D.C	250	85	15.2
			TD-32		10°E	A.C. and D.C.	250	140	18.0
			TD-34		10°E	D.C.	250	155	18.0
			TD-35		90°H	A.C and D.C.	250	80	18.0
			TD-38		10°E	PULSE*	(250)	(90)	15.2
3.30-4.90	S	WR-229	TD-24	6852	10°E	A.C. and D.C.	250	65	15.2
			TD-30		10°E	A.C and D.C.	250	110	18.0
3.95-5 85	C	RG-49/U	TD-10	6356	10°E	D.C.	250	70	15.2
			TD-39		10°E	PULSE*	(250)	(80)	15.2
			RXB103422		10°E	D.C.	250	(110)	18.0
5.85-8.20	X	RG-50/U	TD 10	6356	10°E	D.C.	250	70	15.2
			TD-39		10°E	PULSE*	(250)	(80)	15.2
			RXB103422		10°E	D.C.	250	(110)	18.0
8.20-12.40	X	RG-52/U	TD-11	6357	10°E	D.C.	200	75	15.2
			TD-23	6882	10°E	D.C.	200	115	18.0
			TD-40		10°E	PULSE*	(200)	(85)	15.2
			RXB103093		90°H	D.C.	200	(35)	15.2
			RXB103394		90°H	A.C and D C.	(100)	(50)	15.2
12.4-18.00	K	RG-91/U	TD-18	6684	10°E	D.C.	200	70	15.2
			RXB103399		10°E	D.C.	200	(110)	18.0
			RXB103409		10°E	A.C. and D.C.	(100)	(65)	15.2
			TD-41		10°E	PULSE*	200	(80)	15.2
			RXB103411		90°H	A.C. and D.C.	(100)	(50)	15.2
			RXB103254		90°H	D.C.	200	(40)	15.2
18.0-26.5	K	RG-53/U	TD-13	6359	10°E	D.C.	200	65	15.2
			RXB103423		10°E	D.C.	200	(100)	18.0
			TD-42		10°E	PULSE*	(200)	(75)	15.2
			RXB103411		90°H	A.C. and D.C.	(100)	(50)	15.2
26.5-40.0	K	RG-96/U	RXB103251		10°E	D.C.	(150)	(120)	15.2

NOTE 1: Anode current and tube drop are D.C. values. Values in parentheses are tentative.

NOTE 2: D.C. operation—Cathode at one end only.
A.C. and D.C. operation—Cathodes at both ends.
Pulse operation—Cathode at one end specially designed for pulse operation.

NOTE 3: The Excess Noise Ratio in DB is 10 log $\left(\frac{T\ \text{eff}}{290} - 1 \right)$

*If the anode current during the "on time" of a square pulse (of greater than 100 micro sec. duration) is nominally the same as the rated D.C. anode current, the tube drop during this period will be approximately the same as the rated D.C. tube drop.

26

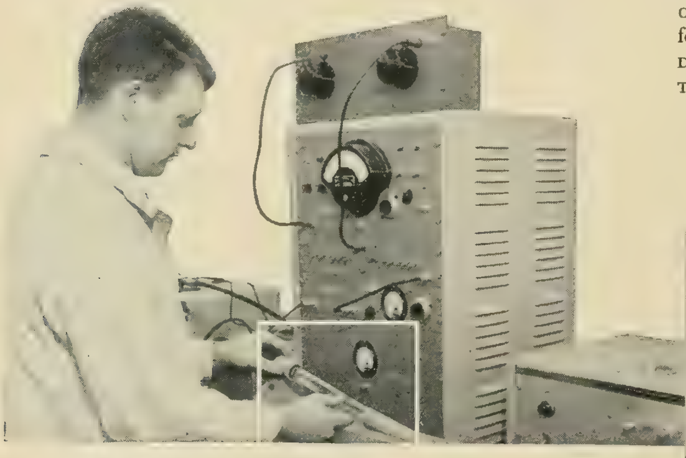
NEW TYPES ADDED TO BENDIX NOISE SOURCE TUBE LINE!

Expanding its line from 9 types to 35 types, Bendix Red Bank now offers a great variety of noise source tubes.

But great variety is only one advantage. Noise source tubes that are free from ambient temperature corrections are the result of making tubes so that no correction in noise figures is necessary from −55°C. to +85°C. What's more, long life and unusual stability result from precise quality control—far beyond the usually accepted tolerances for such products.

Whatever your applications, whether for 10° or 90° angle mounting, check with our specialists for the most efficient solution. Write RED BANK DIVISION, BENDIX AVIATION CORPORATION, EATONTOWN, NEW JERSEY.

West Coast Sales & Service: 117 E. Providencia Ave., Burbank, Calif.
Export Sales & Service: Bendix International Division,
205 E. 42nd St., New York 17, N.Y.
Canadian Distributor: Computing Devices of Canada, Ltd., P. O. Box 508,
Ottawa 4, Ontario



Microwave test equipment used in calibrating all Bendix noise source tubes.

Red Bank Division

Bendix
AVIATION CORPORATION

Circle No. 62 on Subscriber Service Card.

Navy to Test *Polaris* In about 18 Months

Polaris, underwater missiles and detection of submarine-launched missiles were major items discussed at a recent press conference held by RAdm. F. S. Withington, Chief of the Navy Bureau of Ordnance.

Adm. Withington told newsmen the Navy would carry out the first actual tests of *Polaris* in about 18 months. The tests, he said will be conducted off the Cape Canaveral test center, first from a fixed platform and then from a mobile launcher. Following further test launchings from the USS *Observation Island,* the underwater missile will be taken aboard a submarine as a full-fledged operating weapon.

Turning to another phase of submarine-launched missiles, Adm. Withington said detection of such missiles is still an important unsolved problem. A third item in the same area was the admiral's statement that the Navy is interested in an underwater-to-air-to-underwater missile. In the area of submarine detection and defense, he stated sonar capability today is five times as good as that in use during World War II.

Other points which came up during the conference included a proposal to use a beefed up version of the *Talos* as anti-missile missile is under consideration by the Army. The admiral explained the proposal calls for boosting the ramjet propulsion of *Talos* to a speed of Mach 10 within the next 10 years, and added the comment that the missile would be capable of flights to an altitude at more than 50,000 feet.

Touching on other matters, Adm. Withington said the addition of metallics to composite fuels is a major breakthrough in solid fuels. While the addition of metallics greatly increases the energy, a big problem is methods of handling the heat generated when aluminum powder is added to the fuel supply, he said.

Adm. Withington said nuclear warheads are not planned for use in mines and the rocket-assisted torpedo, known as *RAT,* because of *RAT's* short range and the fact that it would be too dangerous to use fissionable material in actions originating on the ocean bottom.

It will be several years before all ships of the Fleet can be equipped with missiles because of the expense, the Ordnance Bureau Chief told members of the press.

Bench-Top Proving Ground for Missile Controls!

Directional controls for guided missiles . . . tracking and scanning devices . . . cameras . . . range finders—how well they work depends greatly on the efficiency of their optical systems.

Recognition Contrast Rendition equipment at B&L completely eliminates human error in measuring optical efficiency. Its direct-reading scale automatically rates how well an optical system can "see" under lighting conditions of variable intensity, as experienced in actual use. Accuracy: 1/40th of a wavelength of light!

This instrument is not for sale. It is part of the unique quality control system that has made Bausch & Lomb the dependable optical source.

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(on official letterhead, please, indicating title.) Bausch & Lomb Optical Co., 87028 St. Paul St., Rochester 2, New York.

BAUSCH & LOMB
SINCE 1853

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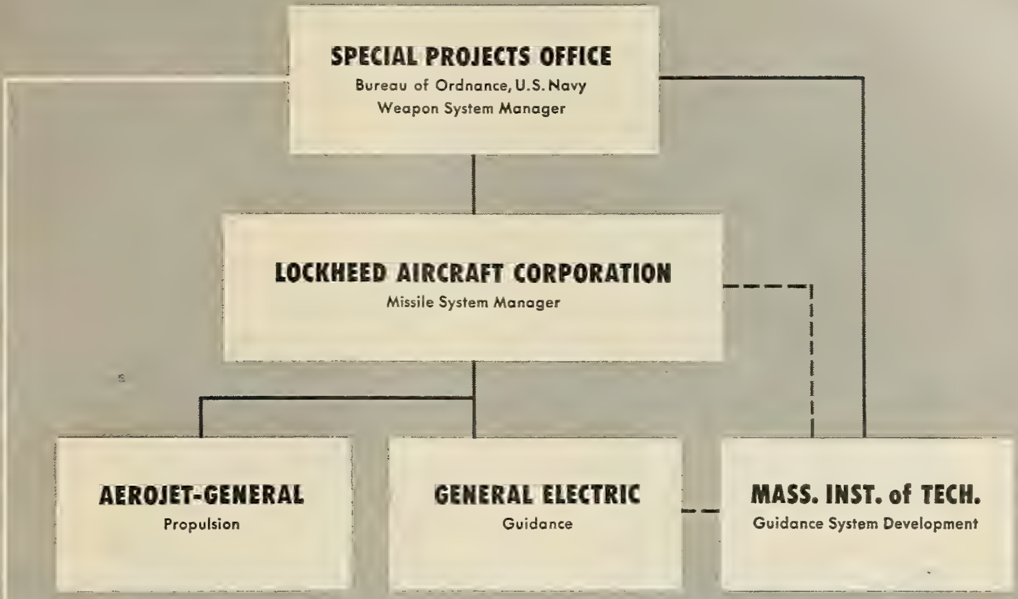
This is the task force developing the

POLARIS

—new Fleet Ballistic Missile for the U.S. Navy


SPECIAL PROJECTS OFFICE
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Guidance System Development

Also working under the direction of the Special Projects Office, U. S. Navy, on various phases of the POLARIS weapon system are: U.S. NAVY BUREAU OF SHIPS, SPERRY GYROSCOPE CO., WESTINGHOUSE, and over 200 sub-contractors—a team of America's topmost scientific talent with vast technological resources, working on the Navy's top-priority missile project.

Fourteen months ago Lockheed was appointed missile system manager of the POLARIS. The objective: to develop a solid-propellant missile with a thermonuclear warhead, which could be launched underwater from nuclear submarines to hit targets 1,500 miles away. The technological problems involved were admittedly the most complex yet encountered in the history of ballistic missile development.

Progress to date on the POLARIS has exceeded all expectations of the U.S. Navy. Lockheed is proud to be associated with its fellow task force members and the sub-contractors developing the complete POLARIS weapon system. The brilliant contributions and splendid teamwork of these more than 200 POLARIS subcontractors, and their dedication to our mutual goal—greater security for our nation—speeds the progress of the POLARIS missile system, prime responsibility for which is Lockheed's.

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LOCKHEED MISSILE SYSTEMS DIVISION: *Palo Alto, Sunnyvale and Van Nuys, California*

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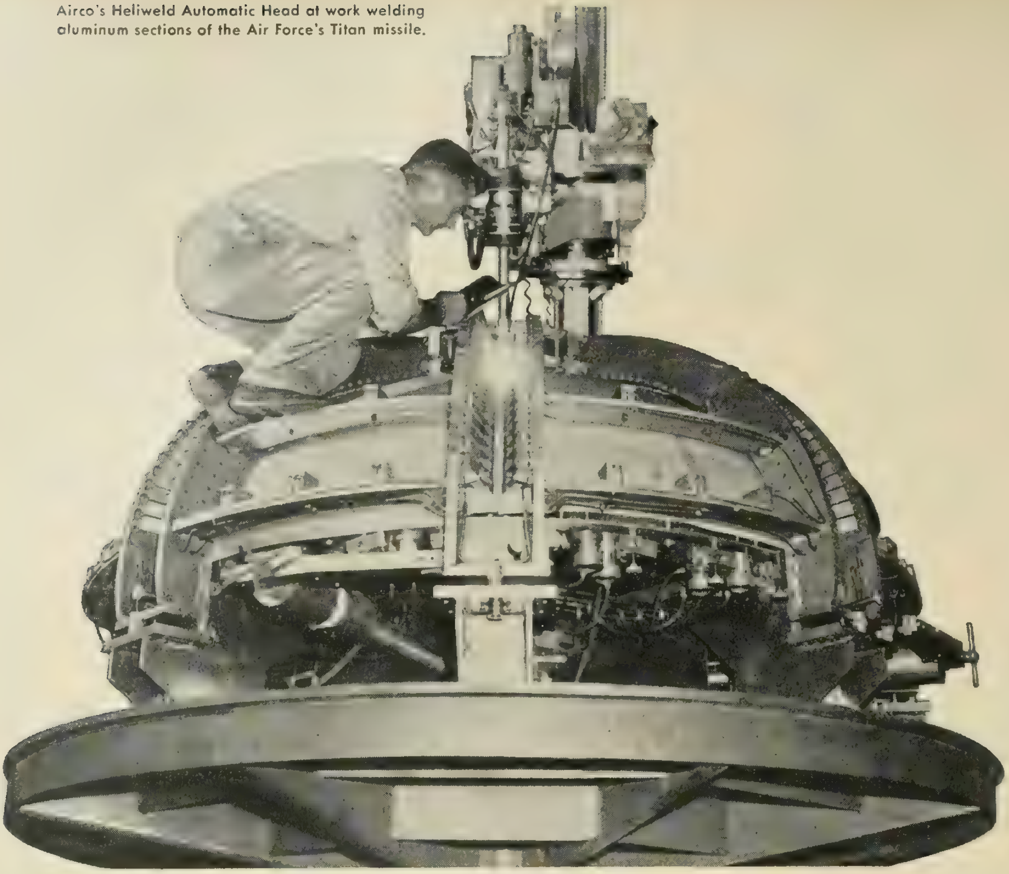
Circle No. 63 on Subscriber Service Card.

Airco's Heliweld Automatic Head at work welding aluminum sections of the Air Force's Titan missile.



AIRCO HELIWELD PROCESS WELDS MISSILE FUEL TANKS

To weld the thin aluminum fuel tank "orange peel" sections of the Air Force's Titan, the Martin Company uses the largest precision welding tool installation in the United States. It is designed and engineered by Air Reduction's Machine Welding Dept. Key unit in the equipment is the Airco Heliweld Automatic Head, which, with its precision arc voltage control, gives consistent high quality weld results. The unit is flexible, can be used for ferrous or non-ferrous materials.

Heliweld equipment for other industries

Versatile Heliweld units are available for use wherever smooth, high quality welds are required, involving either regular or irregular shapes. Typical applications: tubing, piping, steel strip, electronic components, aircraft, food processing machinery.

For complete information call your nearest Air Reduction office.

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AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT • Products of the divisions of Air Reduction Company, Incorporated, include: AIRCO — Industrial gases, welding and cutting equipment, and acetylenic chemicals • PURECO — carbon dioxide — gaseous, liquid, solid ("DRY-ICE") • OHIO — medical gases and hospital equipment • NATIONAL CARBIDE — pipeline acetylene and calcium carbide • COLTON — polyvinyl acetate, alcohols, and other synthetic resins.

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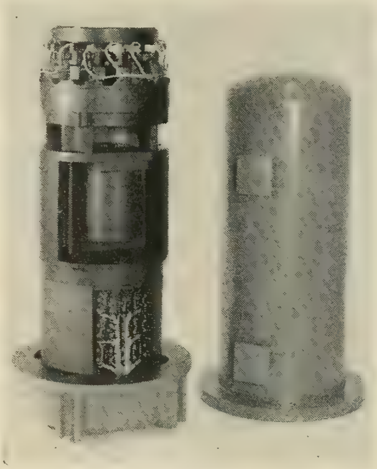
New Products

Multiplexer handles signals from 90 units



A device for PDM commutating and coding has been developed by Consolidated Electrodynamics. Termed the type 40-101 Plexicoder, the instrument commutates signals from up to 90 transducers at 112.5 samples per second and converts them into duration-modulated pulses suitable for telemetering or magnetic tape recording. The unit is designed for flight-test instrumentation in missiles, rockets, or manned aircraft.

In the instrument, low-speed magnetic switching at the input, with high-speed commutation and coding accomplished by interrupting a light beam, replaces rotating wiper-arm assemblies and wide-band chopper-stabilized amplifiers. Transients in the data-channel input circuit are practically eliminated by galvanometers with their inherent natural filtering characteristics.

Designed for a service-free life of 1000 hours, the Plexicoder is compatible with low-output resistive-type transducers, its output can modulate a transmitter or subcarrier oscillator, and it can be used with standard magnetic-tape recording equipment. It will accept single- or double-ended, high- or low-level inputs.

In the device, each input signal is fed through two hermetically sealed, magnetically operated switches, which act as a double-pole, single-throw switch, to a galvanometer. The unique design of this input switch eliminates induced voltages normally associated with a magnetic switch. These switches are opened and closed in a predetermined time sequence by moving magnets, so that a given galvanometer is energized by a transducer for only a specific time period. Each galvanometer may accept as many as six different inputs in sequential fashion.

The Plexicoder can provide four different operating modes or conditions from the same instrument, merely by changing adapter plugs in the input circuit. These modes are 90x1.25, 45x2.5, 30x3.75, and 15x7.5. In each mode, the commutation rate equals 112.5 samples per second.

The unit is shock mounted and will operate in any position. The instrument weighs 45 lbs. and is approximately 25″ high, with a diameter of 8¼″ except for the end section, which is 10½″. The unit is pressurized at 3 to 5 psi.

Circle No. 243 on Subscriber Service Card.

Clothes for Fuel Handlers Resists Acids, Corrosion

Newly developed industrial apparel of 100% DuPont Dacron has been introduced by Worklon, Inc. In addition to being resistant to damage by acids and corrosive chemicals, the new clothing has been proved unusually resistant to concentrated hydrogen peroxide.

Worklon blue or grey Dacron shirts, pants, laboratory coats and coveralls retain their tensile strength even after eight hours of immersion in 90% concentration of hydrogen peroxide at room temperature. The apparel will not ignite, even on longtime contact with H_2O_2.

Circle No. 239 on Subscriber Service Card.

Ceramoplastic Heat Limits Set Higher After Test

Operating temperature limits on Mycalex Corp.'s Supramica 560 ceramoplastic have been raised, due to an accidental overexposure of the material to 1600°F. The company had originally established the upper limits of the material at 950°F, but a control failure in the test oven boosted the temperature on a sample to 1600°F for more than 24 hours. The only damage done to the specimen was that two steel inserts were burned away, while the ceramoplastic sample suffered only scorched edges in the process but maintained its strength, retained its shape and was still firmly bonded to the remains of the steel bolts.

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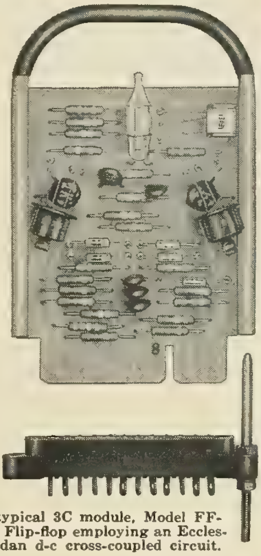
Implement your digital system with

COMPUTER CONTROL

M PACs

M-PACs are fully compatible, transistorized, digital, plug-in, printed circuit modules. M-PACs provide the utmost in compactness — as many as 75 PACs may be mounted in a standard 8¾ inch rack panel space.



A typical 3C module, Model FF-103 Flip-flop employing an Eccles-Jordan d-c cross-coupled circuit.

The M-PAC family includes flip-flops, pulse amplifiers, gates, buffers, emitter-followers, variable frequency oscillators, crystal-controlled oscillators, inverter amplifiers, one-shot multivibrators, and others.

Typical applications of M-PACs . . .

- data handling
- control
- instrumentation
- computing systems

Write for illustrated 20-page Catalog M.

3C

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Circle No. 111 on Subscriber Service Card.

. . . New Products

Teflon Tape Bonded to Copper Foil

Continental-Diamond Fibre Corp. is developing a glass-supported Teflon tape with copper foil bonded to one or both sides for use as etched flexible cable harnesses for missiles. The tape may also be used as flexible connector in multiple-array printed-circuit "stacks" for computers and control devices.

In this new printed-circuit material, electrolytic copper foil in weights of either 1 or 2 oz. per sq. ft. is applied to one or both sides of cementable glass-supported Teflon tape. Depending on the weight of copper foil and the Teflon tape grade, the overall thicknesses run from .006″ to .016″.

At the present time, CFD can furnish this material on a developmental basis in lengths up to 30′ and widths up to 6″. The company expects, within 60 or 90 days, to manufacture it on a production basis in lengths of 100 ft. or longer.

The new flexible materials have excellent shock and vibration resistance, combined with high mechanical strength and dimensional stability, plus excellent electrical properties. It can be bent to a radius of ½″. If supplied with copper foil on one side only, the other side can be furnished "cementable" or "non-cementable," as desired. For certain specialized applications, copper foil cemented to unsupported Teflon tape can be supplied.

Circle No. 242 on Subscriber Service Card.

High Temperature Relay Resists Shock, Vibration

A sensitive, miniature-tube relay with high shock and vibration resistance and 125°C ambient temperature capabilities is available from Potter & Brumfield, Inc. A 30% increase in shock and vibration resistance and a 50% decrease in power consumption was effected by redesigning and repositioning the armature and contact systems, balancing the armature, and improving the ampere-turns to reluctance ratio.

This SPDT relay operates on 40 milliwatts under shocks of 30g and vibrations of 10g to 500 cps. Where high shock- and vibration-resistance are not required, the unit, designated PW, will operate on 25 milliwatts. The relay will operate on current up to six amps and voltages up to 115 VDC.

The PW can be supplied with 7-pin miniature plug-in headers for tube socket or printed circuit mounting or with pierced solder lugs and brackets for flange mounting above or below the chassis. A balanced armature permits mounting in any position without significantly affecting shock and vibration resistance.

Circle No. 228 on Subscriber Service Card.

Miniaturized Switch Has Long Life Under High Heat

A miniaturized precision switch with a minimum life of 25,000 operations at 600°F has been introduced by Micro Switch, a division of Minneapolis-Honeywell. Designed for use on jet engines, rocket-powered missiles and electronic gear subjected to a great deal of heat or radiation, the new switch can be utilized in any application where a small high-temperature switch is desired without sacrificing quality.

The new switch, designated "V-3-1301," has a case, cover and plunger molded from a special-type glass-bonded synthetic mica, which features maximum dimensional stability, ability to withstand repeated shock and vi-

Send your tough fuel injection problems to DELAVAN

For years Delavan has been designing and developing Fuel Injectors for the most advanced engines and thrust augmenters. A cross section of the Delavan experience available to you would include fuel injectors for engines powering *Liquid Propellant Rockets, Ramjets, Pulsejets, Turbojets and Turboprops.*

And remember, Delavan has the most complete facilities anywhere for testing and producing these injectors once they've received your approval. Highly trained manufacturing personnel accustomed to working to the highest standards translate the most difficult designs into production models and deliver the quantities you'll need on time. How can we help you?

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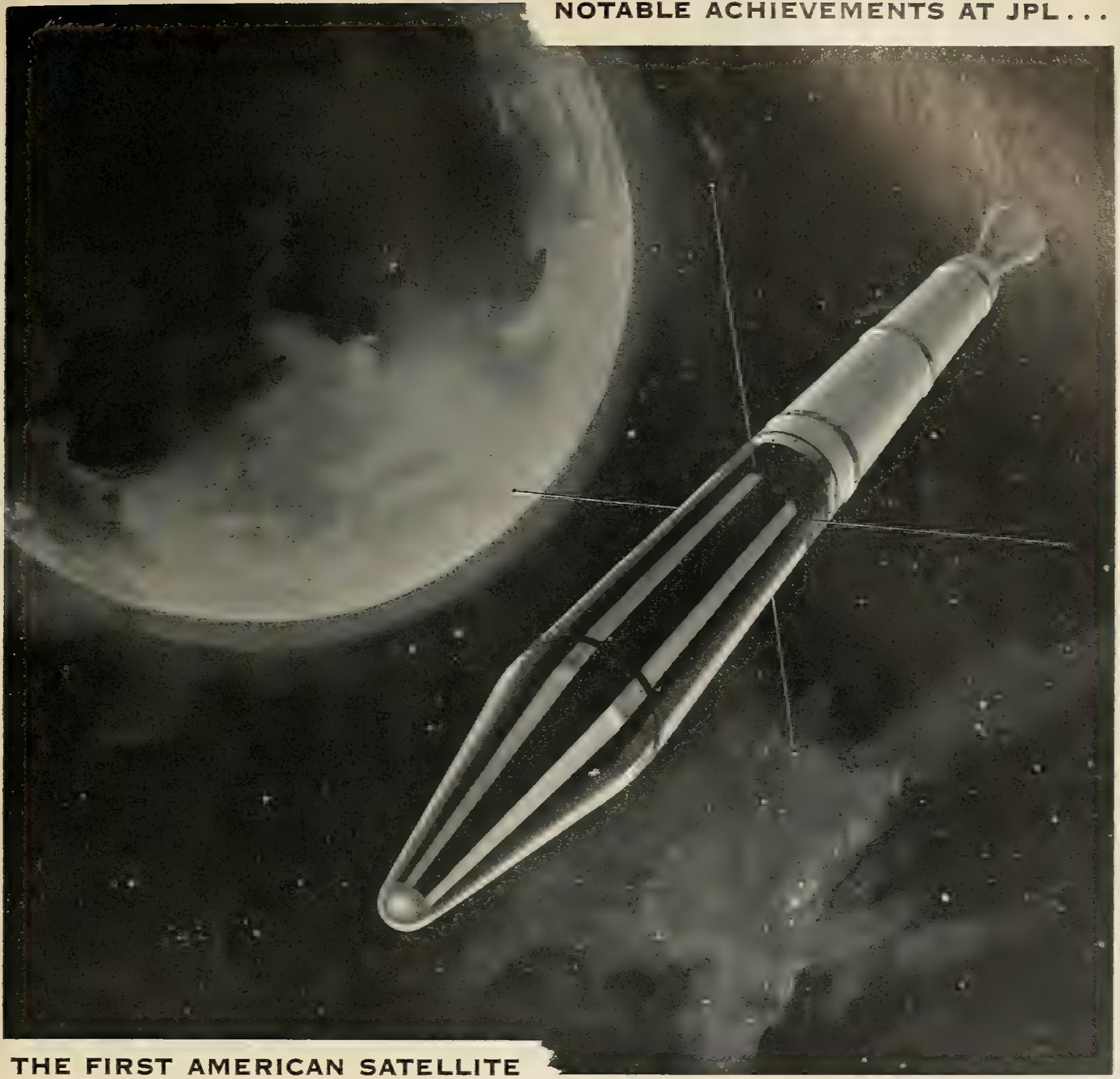
NOTABLE ACHIEVEMENTS AT JPL . . .



THE FIRST AMERICAN SATELLITE

With the launching of the "Explorer," in joint co-operation with the Army Ballistic Missile Agency, the Caltech Jet Propulsion Laboratory fulfills one of its prime functions as a pioneer of the future.

The Army's request for JPL to join in the effort to put an American satellite in orbit was the type of appeal most likely to arouse the enthusiasm of the Laboratory personnel — nearly 2,000 of them.

Challenged by this exceptional opportunity, JPL personnel designed and fabricated the final three stages of the Jupiter "C" missile and, in addition, designed and developed the satellite itself in 80 days.

The close co-operation and co-ordination of effort with the ABMA and the U. S. National Committee for the IGY, make JPL proud to have been a close partner with the U. S. Army in developing and launching the first American satellite.

Now, JPL, maintaining its established policy of scientific research, continues to assist in tracking, receiving, correlating and evaluating data from the "Explorer" as one of its many contributions toward solving the problems of the future.

CAREER OPPORTUNITIES NOW OPEN IN THESE FIELDS

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bration, resistance to moisture and extreme humidity, resistance to radiation and complete resistance to formation of radioactive byproducts. The switch has a two-piece snap-action spring that provides sure contact.

Flat bosses around the mounting holes, on both sides of the switch case, facilitate rigid mounting on common screws or rods for multiple cam control of several electrical circuits. The contact arrangement of the high-temperature switch is single-pole double-throw. The switch may be wired either normally-open or normally-closed. It has standard screw-type terminals.

Characteristics of the V3-1301 include operating force, 6 to 14 oz.; release force, 4 oz. min.; pretravel, .047" max.; differential travel, .006" to .016"; over-travel, .031" min.; weight, .017 lb. max.

Electrical rating of the switch is 10 amperes at 125 or 250 vac; ½ ampere at 125 vdc, ¼ ampere at 250 vdc. At 30 vdc the inductive rating is 10 amperes at sea level and 6 amperes at 50,000 ft. The 30 vdc resistive rating is 10 amperes, or 6 amperes for a motor.

Circle No. 225 on Subscriber Service Card.

Simulation Table Planned for Smooth Operation

The "Micro Gee" simulation table is designed for angularly displacing gyros and accelerometers, in pitch and roll, either statically or dynamically. Extremely smooth operation is obtained by using specially designed driven pendulum mechanisms.

The servo controlled table is used in conjunction with an analog computer to make "flight testing" of a complete aircraft or missile stabilization system possible on the ground, as contrasted to such programs where gyro and accelerometer dynamics are linearly simulated. In addition, the two-degree-of-freedom simulation table may be used as an oscillating table to determine the threshold characteristics of high performance gyros and accelerometers.

The table will follow signals such as those from an analog computer, a low-frequency function generator, a tape recorder, or a digital-to-analog converter, when these signals are applied to the input terminals of the dc power amplifier that drives the table.

Circle No. 229 on Subscriber Service Card.

Ratio Transducer Gives Accuracy Over Wide Range

A new Mach number and pressure ratio transducer utilizing design advantages of a force balance mechanism to provide exceptional accuracy has been developed by Burton Mfg. Co. The unit operates at very high altitudes and over wide temperature ranges and features freedom from bellows or diaphragm hysterisis effects and friction errors.

This basic system operates from −65°F to 185°F and to very high altitudes. Its accuracy is of a high order at critical operating points. The advice produces an electrical output to the ratio of static and pitot pressure input. However, it can be provided to produce electrical output in response to the ratio of any two independent pressures as an output, within the capacity of the instrument. The output can be through a synchro or a similar ac-type unit, or a potentiometer, depending on specific requirements.

In this transducer, bellows translate pressure into forces acting upon beams. Misplacement is sensed through an inductive pickoff, the signal of which is amplified. Through a servo loop, a fulcrum moves to a position

photo courtesy of Convair

WELDMATIC PRECISION WELDING JOINS "DIFFICULT" MATERIALS INSTANTLY FOR CONVAIR

Making spot welds in millisecond time, this Model 1016 Weldmatic Welder speeds up instrument assembly involving difficult materials at Convair. Here it's used to assemble 28-30 gauge iron thermocouple leads to low-carbon steels, aluminum alloys and magnesium alloys. Sturdy joints provide unusual resistance to acceleration, vibration and high temperature; joint uniformity provides high reliability. Write for technical data on the Weldmatic line.

WELDMATIC DIVISION OF UNITEK CORPORATION
270 North Halstead Avenue • Pasadena, California
SALES ENGINEERING REPRESENTATIVES IN PRINCIPAL CITIES

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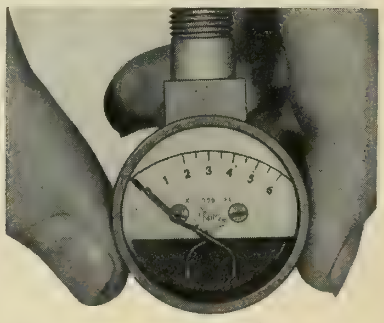

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*Miniaturized **bourdon helix** gauges, pioneered by Glassco Instrument Company, have only one moving part. No gears, no linkage, they offer exceptional performance and reliability with minimum space and weight, plus design flexibility to meet unusual specifications.

For details, write for Bulletin G-1003

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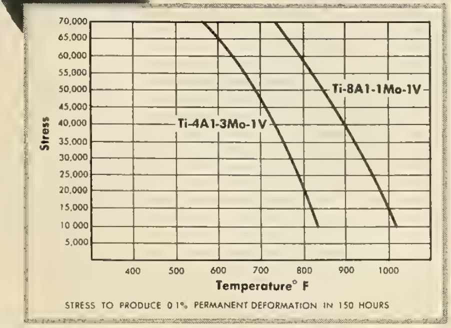

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Creep can ruin your best designs!

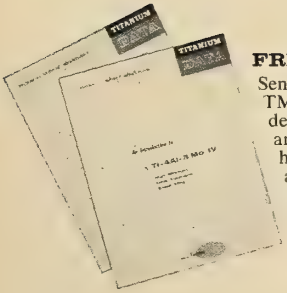
Whether your creep problem is sagging socks or stretching struts, the result is pretty much the same: Things don't hold their shape the way they should.

Garters we don't have. But we do have new titanium alloys which offer a rare combination of excellent creep resistance plus light weight (density 0.163 lb/cu. in.), great tensile strengths (to 175,000 psi), and outstanding corrosion resistance.

In bar and forging stock, there's Ti-8A1-1Mo-1V. Its short-time elevated temperature properties are similar to Ti-6A1-4V, one of the most widely used titanium alloys. Yet "8-1-1" offers as much as a tenfold increase in creep strength between 600° F, and 1000° F. This means that, for an equivalent stress level, Ti-8A1-1Mo-1V raises the effective operating temperature *150° F.*

In sheet stock, there's Ti-4A1-3Mo-1V, which offers excellent formability because of good tensile elongation, bend ductility, and low yield strength in the solution-treated condition. Yet this alloy can be heat-treated to strengths of 175,000 psi.

At Toronto, Ohio, Titanium Metals Corporation of America is now operating the world's only plant designed and instrumented solely for rolling and forging titanium. With this facility, TMCA can furnish you the best quality metal, on the fastest delivery schedule, at the lowest possible price in the industry today.



FREE:
Send for TMCA Data Sheets describing physical and mechanical properties, heat treatment methods, and other useful information about the new creep-resistant alloys.

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Can this experience in unique cooling applications help solve a problem for you?

Custom designed cooling is our business at Ellis and Watts. For example, we have recently engineered and built highly specialized equipment for the following applications:

- Liquid coolers for electronic components (bulletin 94)
- Cooling Klystrons with air to liquid heat exchangers (bulletin 95)
- Special units to cool airborne electronic gear (bulletin 99)
- Cooling equipment for huge complex electronic computers (bulletin 102)
- Electronic console and rack coolers (bulletin 105)
- Small portable field units to cool huts filled with electronic gear for missile ground support, battlefield television, communications and radar (bulletin 106)
- Conditioning systems for Radome shelters (bulletin 108)
- Mobile cooling units for trailer-mounted electronic systems for missile and aircraft ground support (bulletin 111)
- Units to cool automatic landing devices for carrier and land-based aircraft (bulletin 122)
- Cooling equipment for fixed or mobile flight training simulators (bulletin 124)
- Dewpoint control equipment for pressurized radar waveguides (bulletin 128)

These are but a few examples. On land (MIL-E-5272A), on the sea (MIL-E-16400B), in the air (MIL-E-5400B) — even in outer space (MIL-E-8189A) — E-W specialized cooling equipment guarantees the performance of your electronic systems, independent of environmental conditions, for military or commercial applications.

If your project involves cooling . . . it's a job for Ellis and Watts. We are staffed with specialists who will analyze your requirements, submit a proposal, design and build equipment promptly and to your complete satisfaction. Field installation and maintenance services available.

Ellis and Watts Products, Inc., Dept. M, Cincinnati 36, Ohio
Please send the following information:

☐ Bulletin 94 95 99 102 105 106 108 111 122 124 128 (circle numbers desired)
☐ Cooling load calculating Nomogram
☐ Booklet "How to determine requirements for cooling electronic equipment"

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Company..
Address..
City..Zone...........State..

ELLIS AND WATTS PRODUCTS, INC.

Cincinnati 36, Ohio.
Designers and builders of MIL-AC Units

Circle No. 67 on Subscriber Service Card.

which balances out forces upon the beam.

The system is basic in design and may be applied to produce an output as the result of Mach number or any pressure ratio. With a minor adaptation, the system provides a highly sensitive and accurate altimeter.

Circle No. 236 on Subscriber Service Card.

Parabolic Antennas Include Mounts, Systems

A series of 19-foot parabolic antennas are available from Technical Appliance Corp., including various combinations of mounts and feed systems using the same reflector.

The reflector is made up of four pie-shaped sections to facilitate easy transportation to installation site. The individual sections are readily assembled into an extremely rugged structure. The structural base of the antenna is a circular ring truss 8 feet in diameter. Preformed radial members fan out from the ring truss to the tips of the reflector. Circumferential tubing is heliarc-welded to the radial members. A rigid ring circumvents the entire structure. Reflecting surface is ½″ expanded aluminum mesh, the entire antenna being iridited and painted for long-lasting finish.

A choice of ground mount or tower mount is available. Both permit azimuth and elevation adjustments through 10″ of travel. Standard feeds are either dipole or horn-type, and special feeds for specific requirements are available on order. In addition, the reflector is available without feed system and with or without mount.

Circle No. 240 on Subscriber Service Card.

Signal Simulator Checks Telemetering Ground Units

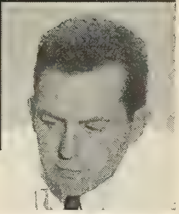
The ASCOP MSS-3 is an accurate and flexible laboratory standard for simulating PW signals of 30x30, 45x20, 60x15, and 90x10 configurations for the checking and calibration of telemetering ground stations. It is specifically designed for use in the testing of PW telemetering stations used in the aircraft and missile field, as well as for engine teststands, nuclear reactors, powerplants, and similar projects. The MSS-3 makes use of solid-state devices throughout, with transistors operating in the switching mode exclusively. It provides accurate PW test signals while containing no commutator, operating mechanical components, nor electronic tubes. Consequently, the life of the unit is neither dependent on mechanical considerations nor tube life. Both standard PW and a differentiated PW output to simulate PW/PM signals are provided.

Circle No. 233 on Subscriber Service Card.

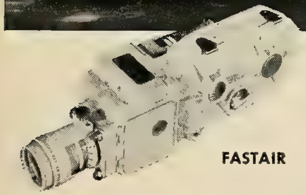
Electronic Recorder Reads Up to Four Remote Sources

An electronic recorder that can receive and record output from as many as four remote ring balance meter-operated slide wires has been developed by Hagan Chemicals & Controls, Inc. The instrument can be used to record any quantity measured by a Hagan Ring Balance Meter, includ-

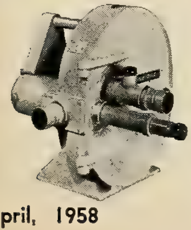
"No research tool surpasses the *HIGH SPEED* Motion Picture Camera in usefulness



A. J. White, Director
Motor Vehicle Research



FASTAIR



WF-14
FASTAX

"During the last several years, we have found high speed motion picture photography the fastest, most reliable means of solving many of our research problems.

"The Wollensak FASTAX High Speed motion picture camera is most desirable to me because of a number of features. A magazine capacity of 400 feet allows a longer time for film recording. The one millisecond timing mark available on film exposed in the Fastax has saved us many hundreds of hours of interpolation and laboratory time.

"We have gotten excellent results with the FASTAIR camera, when positioned in an automobile crashing a fixed object. The kinematic behavior of test dummies and vehicle structural failures were recorded as they occured."

FASTAX Cameras are available in 8, 16 and 35mm sizes with film capacities to 400′.

Write for new bulletin.
Inquiries are welcomed.

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Optical Company, Rochester 21, N. Y.

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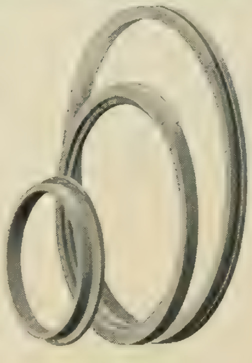
here for
second best



Steel rings are important components of missiles, rockets, aircraft and engines—and here only the best are acceptable. "Seconds" won't do!

Edgewater prides itself on the dependable high quality of its rings. Weldless rings are rolled from solid blocks of steel by a process which produces fine-grain, uniform metal texture. Welded rings are precision-formed from extruded or rolled bars, and flash-welded by modern electronically-controlled equipment. Simple or complex ring sections are formed to close tolerances, thus reducing machining and scrap-loss. Diameters of weldless rings are 5 to 145 inches; welded rings, up to 48 inches.

We will be glad to send you our descriptive bulletins.

Edgewater Steel Company

P. O. Box 478 • Pittsburgh 30, Penna.

Circle No. 108 on Subscriber Service Card.

ing fluid density, liquid level in open or closed vessels, boiler-drum water levels and temperature- and pressure-compensated fluid flow readings.

Heart of the recorder is a newly designed electronic receiver, a compact unit housing an amplifier, input box, servomotor and slide wire. As many as four receivers can be installed in a single recorder. Various accessory combinations, including a pneumatic transmitter for control system signals, slide wire output for logging systems, alarm contacts and computing devices, can be used with the receiver.

Circle No. 227 on Subscriber Service Card.

Glass Fiber Jet Vane Reinforced With Resin

American Aerophysics Corp. has announced the successful fabrication and test of a jet vane manufactured of laminated glass fiber, reinforced with phenolic resin. The Jet Propulsion Laboratories of the California Institute of Technology, designers of the jet vane configuration, have stated that tests in the rocket blast of a missile have proven extremely successful.

A unique arrangement of laminations was employed which produced superior resistance to the severe eroding environments within the rocket blast. Instead of laying the laminates in parallel, they were placed with their edges sloped in the direction of the jetstream in order to avoid separation or tearing of the individual laminates. An extremely high-strength phenolic resin was used as a binder.

Circle No. 238 on Subscriber Service Card.

Pinhole Coil Winder Does Miniscule Job

Stanford Research Institute has developed a machine capable of winding coils on torroidal cores almost invisible to the naked eye. The machine is capable of winding coils with an outside diameter equal to the diameter of the hole through which they are wound, either from the center to the outside of the core, or through two adjacent holes in the same core. The ability of the machine to wind such coils is not impaired by the diameter-to-length ratio of the hole, or holes through which the coil is to be wound. It would be possible to wind a coil through two 0.010" holes spaced on 0.060" centers in a 3"-thick core.

The wire forming the coil is made to pull itself through the hole or holes through which the coil is wound. The set up time on the laboratory model of the machine is about the same as on a standard commercial torroidal winding machine and can be reduced drastically on a production model. Actual winding time per turn is about equal to a standard commercial machine.

Circle No. 241 on Subscriber Service Card.

LINEAR DISPLACEMENT GAUGE

Linear Displacement Gauge Measures 0.001-in. Change

Model 0502 miniature linear displacement gauge available from Tucson Instrument Corp. gives potentiometer-type output for linear displacements as small as 0.001" with a total travel of 0.050". The resistance range of the elements is from 1700 to 5000 ohms. The unit can withstand environmental conditions at temperatures from −25°F to 185°F, shock of 100 g's, vibration of 0.60", double amplitude 20-55 cps and 10 g's 55-1000 cps. Individual calibration graphs are supplied with each instrument.

Circle No. 226 on Subscriber Service Card.

Heat Resistant Laminates Can Handle 3500°F

Continental-Diamond Fibre Corp. has introduced a new type of high-heat-resistant "Dilecto" laminate and "Celoron" molded parts for missile and rocket applications involving operating temperatures up to 3500°F or higher.

A major advantage of the new reinforced plastics is that they retain an exceptionally high percentage of their excellent mechanical properties after exposure to these elevated temperatures for short periods.

One application of the new asbestos-base phenolics involves continuous operation at 500°F and intermittent op-

HONEST JOHN artillery rocket depends on G-E electric heating blanket (inset) to bring missile to uniform operating temperature before launching.

HONEST JOHN FIRING SHOWS HOW . . .

General Electric Specialty Heating Maintains Propellant Temperature

Successful launch—and flight—of the Honest John depends upon exact propellant temperature at the moment of firing. A General Electric heating and insulating blanket—which shrouds missile from nose to nozzle—provides and maintains that temperature!

Proper operation of many types of land and airborne equipment, especially at low temperatures, often depends on controlled heat in the right places at the right time. Experienced G-E heating engineers, backed by complete facilities, have already solved thermal conditioning problems on applications ranging from complete missiles and airborne systems to tiny test instruments.

LET US ANALYZE YOUR HEATING PROBLEM. Whether you need a custom-made prototype, or quantity production, investigate G-E "one stop" service for specialty heating products tailored to your specific needs.

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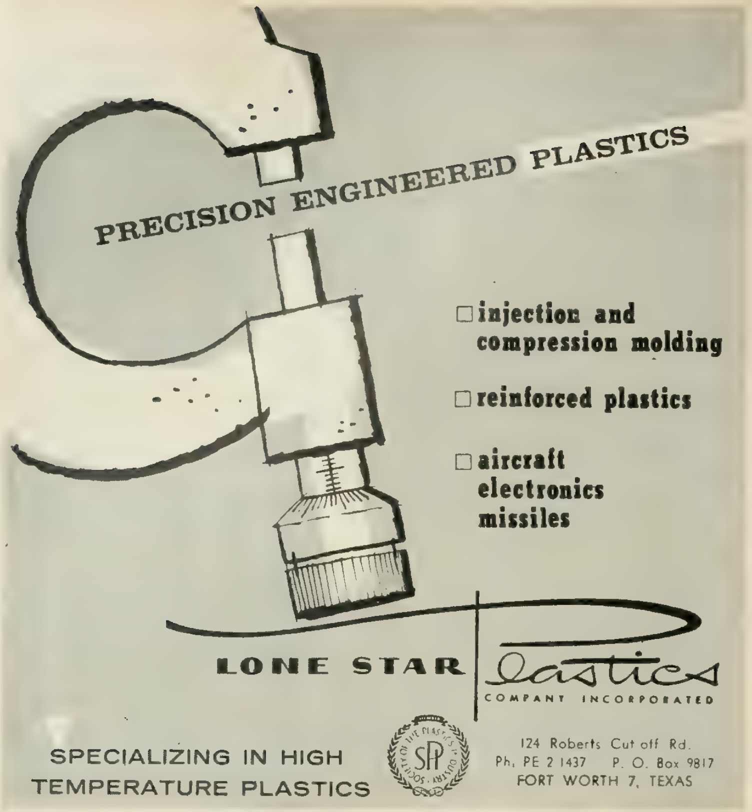

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Continuous electroplating methods permit coating of many metals on to wire (or ribbon) in specified thicknesses of plate . . . This very flexible operation makes it possible to designate a desirable base or precious metal with a coating of another metal for its own particular characteristics. In our laboratory Tungsten wire as small as .00015″ has been electroplated with Gold. . . . New combinations of plating on wire are being developed by our research staff from time to time. Your inquiry is invited.

Consult us, without obligation, about your specific wire problems. Write for list of products.

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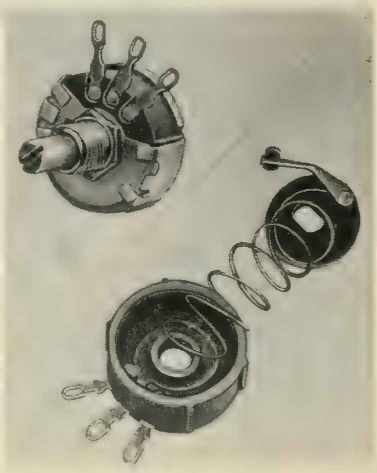
eration at 900°F. Other tests indicate that these laminates and molded parts have withstood temperatures of 2500° and 3500°F for limited periods. They are suitable also for applications based on the new concept of "ablation" or "using up" of materials in certain rocket and missile operations, where temperatures of 4000-5000°F are encountered.

Circle No. 234 on Subscriber Service Card.



Resistor Design Change Reduces Noise Level

Reon Resistor Corporation has developed a completely new design in a molded composition potentiometer. The elimination of the wiper arm collector by use of a beryllium copper spring between the contact arm and the center terminal greatly reduced the electrical noise generated by all conventional potentiometers.

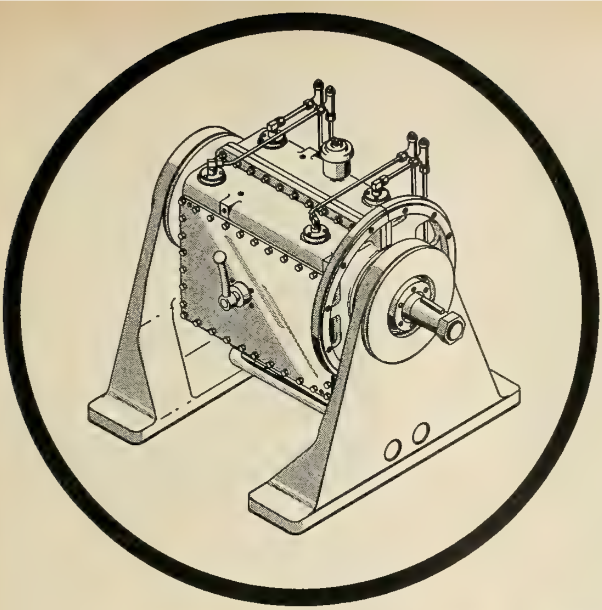
One moving point of contact, the carbon brush, on the resistance element reduces the noise to less than one-half and extends the rotational life of the potentiometer to over a million cycles. An overall resistance change of approximately 6.3% is average.

This potentiometer is manufactured to meet the "Y" characteristic of the new MIL R-94B specification, and is available in all tapers with both standard and locking bushings, as well as water-sealed units.

Circle No. 232 on Subscriber Service Card.

Self-Balancing Ratiometer Adjusts Precision Tools

A dual-channel self-balancing ratiometer for the calibration or adjusting of precision instruments has been introduced by Wallace O. Leonard, Inc. Useful for a wide range of applications,



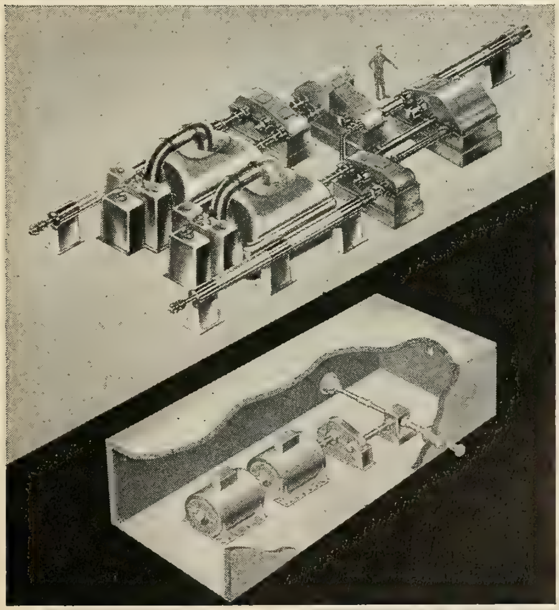
Here's a trunnion-mounted, multi-speed unit used with a dynamometer test facility for guided missile pumps. This unit has a top output speed of 60,000 RPM with a pitch line velocity in excess of 30,000 FPM or more than 340 miles per hour. Unit measures approximately 25 inches in length.

WESTERN GEAR

TEST STANDS and DRIVES...designed to

50,000 HP or 100,000 RPM

This giant test stand facility was designed for use by a leading Eastern aircraft manufacturer. The 2 steam turbines deliver 22,500 HP each. Top output speed is 9,000 RPM and the pitch line velocity is 30,000 FPM.



This test cell presented an "impossible" problem . . . how to transmit 3,000 HP at 7,000 RPM through a right angle gear box? The wall-mounted gear boxes are provided with quick change gear sets which can be shifted from 7,000 to 11,000 and 17,000 RPM. Inspection after unprecedented hours of service show the gearing to be in excellent condition.

Circle No. 68 on Subscriber Service Card.

Western Gear is designing and building drives and test stands for leading missile-components manufacturers and development laboratories ranging up to 50,000 H.P. or 100,000 RPM. Successful tests have carried designs to 200,000 RPM. Pictured on this page are three recent applications. Note the coupon below.

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the unit, with a guaranteed accuracy of 0.0005 ratio, can be utilized on potentiometer output instruments, voltage dividers, initial condition dividers for analog computers and many other precision jobs.

Designated model 700100-2, the ratiometer is designed for either laboratory or field use. It operates on normal 60-cycle line voltage. The self-balancing feature allows the operator free use of both hands for instrument adjustment while continuously observing the potentiometer wiper position. A null indicating light is mounted on the front panel for positive indication of a null condition. A switch allows channel selection for simultaneous checkout of two instruments.

Circle No. 231 on Subscriber Service Card.

Dual Output Generator for Missile Electric Power

The Ruckstell Corp. has completed development and is producing a new high-performance generator for missile electrical power. The dual-output permanent magnet, 24,000-rpm, ac generator produces 5 kva of 3-phase, 400-cps, 20/208 volt, and 3.4 kva of 6-phase, 1600-cps, 23-volt power which is rectified to direct current.

Using a lightweight, static-type voltage regulator to supply a toroidal back-winding, the 400-cps voltage is maintained constant with 0.5 volts for all steady load conditions and has a rapid transient response, recovering from full-load switching in 0.1 second. The rectified direct-current output has an inherent regulation of 26 to 30 volts dc. Overall efficiency of the generator is 90%, and greater reliability and lighter weight are achieved by the elimination of the exciter, brushes and slip rings.

Circle No. 237 on Subscriber Service Card.

New Plastic Tubing Zips Off or on Wires

Designed specifically for use in the electronic circuits of missiles and aircraft, nylar zippertubing is being manufactured by The Zippertubing Co. The product is said to be less expensive and easier and faster to install than conventional tubing coverings requiring pulling wires through tubing or short extruder runs. Used as a protection for existing installed wires, cable or tubing, or as a cable jacket or shield, the new tubing saves up to 90% of installation costs and permits accessibility to workpoints when required.

By laminating mylar zippertubing with aluminum, it is possible to construct shielded cable quickly without the use of additional equipment. The product is available in any desired size from 3/8" to 4" in 1/8" increments

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The equipment you are designing or building may well include a number of small high precision machine parts, and you will be anxious to see that they are produced by a firm in which you can have complete confidence. A firm competently staffed, well equipped, with years of experience, and a reputation for high quality production and complete dependability. LaVezzi, with a history of many years in this specialized field is the answer to this need, and earnestly solicits your quote requests. An illustrated brochure will be mailed promptly upon request.

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POWER
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Dept. MR, 3410 W. 67th St., Los Angeles 43
Over a Quarter Century of Rectifier Manufacturing

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(I.D.) and has an external flap for bead protection. It supplants vinyl zippertubing for use in applications that require wire, cable, or tubing protection against the harmful effects of chemicals.

Clear or metallic-colored mylar zippertubing is available in lengths from 20 to 30,000 feet. Other colors are available upon request. When sealed, the tubing will withstand a lateral pull strength of 60 psi.

Circle No. 230 on Subscriber Service Card.

Flow-Control Valve Permits Precise Control

A new, low-cost flow-control valve, said to permit precise control of air, gas or low pressure hydraulic flow with unrestricted return is being produced by Valvair Corp. Known as the Valvair Micro-Trol, the new valve features locked screw adjustment and a unique combination of controlling elements, a threaded stem and molded nylon flapper. The lower range of flow rates is metered by adjusting the position of the ground cylindrical stem within a concentric bore in the valve body.

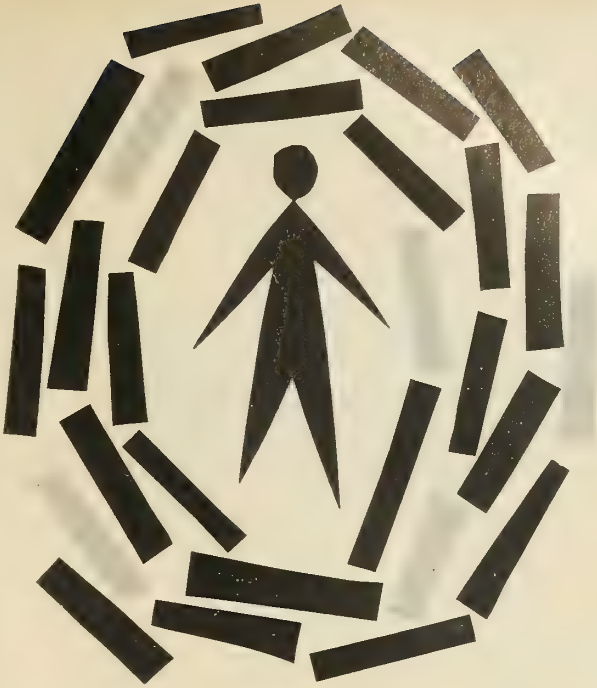
As the regulating portion of the stem clears the bore, the stem end contacts the flapper, lifting it off its seat. Flow is then controlled by the clearance between the flapper and seat. Thus, flow is regulated with fine adjustment, from cutoff to full flow. On return, the flapper lifts clear, affording unrestricted passage of the controlled medium. Flow-rate adjustment is retained by an external lock nut on the slotted adjusting stem.

Valvair Micro-Trol valves are available in sizes ranging from ¼ in. through ¾ in. NPT. Flow area through the valve is said to exceed nominal rated pipe size. Valve body is of cast Navy M bronze, stem is stainless steel and the flapper is molded nylon. An O-ring seals and retains the stem.

Circle No. 271 on Subscriber Service Card.

Motor-Generator Produces Exact 400-Cycle Frequency

A small motor-generator set has been developed recently by the research department of Kato Engineering Co. for use in conjunction with military missile development programs. The generator portion of the unit produces an exact frequency of 400 cycles per second. It is single phase and rated at 1100 watts. The generator is self-regulated with voltage change kept within



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To qualify, at least three years' experience in general circuitry design in both tubes and transistors is required. Experience should encompass areas such as video and pulse circuits, cathode ray tube displays and analog and/or digital computer techniques.

You are invited to write for more information or phone collect. Address R. W. Frost, System Development Corporation, 2414 Colorado Avenue, Santa Monica, Calif.; phone EXbrook 3-9411.

SYSTEM DEVELOPMENT CORPORATION

An independent nonprofit organization, formerly a division of the Rand Corporation

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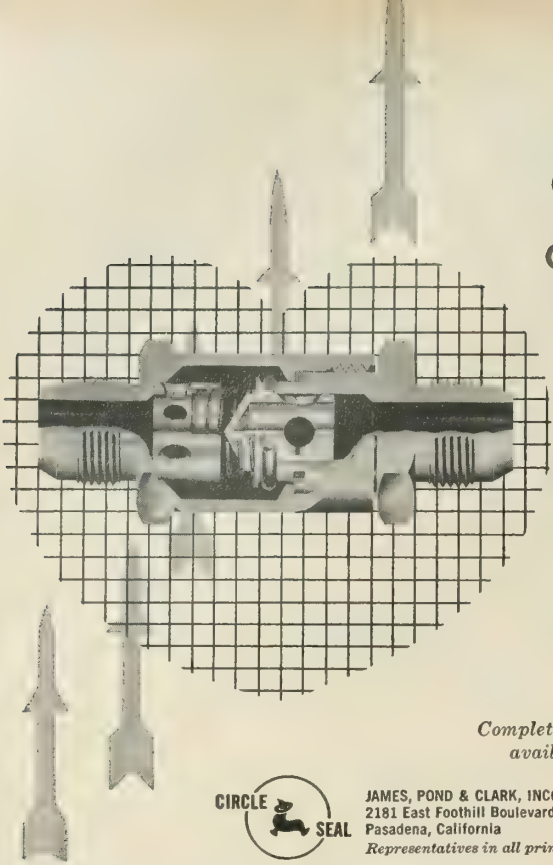

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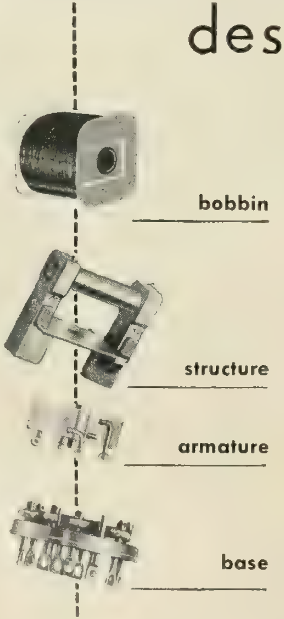

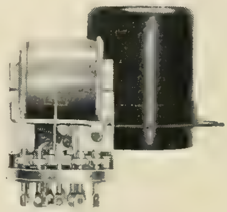

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5% from no load to full load.

The direct current motor is mounted on the same shaft, within the same frame as the alternator and is equipped with a speed governor which maintains constant speed despite load variations. The straddle mounted outlet box and control panel contains the necessary input and output lead wires and receptacles, voltmeter, ammeter, and dc motor starter. The unit is splash proof. Similar AC motor driven units are also available in completely brushless design.

Circle No. 272 on Subscriber Service Card.

Hose Built to Handle Fuming Nitric Acid

Hewitt-Robins, Inc., has developed a hose capable of handling fuming nitric acid missile fuel. The new hose is lined with a tube made of Teflon fluorocarbon resins capable of withstanding the chemical action and high temperatures encountered in the handling of fuming nitric acid. The fluorocarbon tube is reinforced with fabric and covered with a blend of natural and synthetic rubbers bonded to the tube. The hose will withstand temperatures up to 500°F. It is available with stainless steel fittings in diameters ranging from ½ to 3 in. and in lengths up to 75 ft.

Circle No. 273 on Subscriber Service Card.

Micro Switch Shows New Rotary Selection Switch

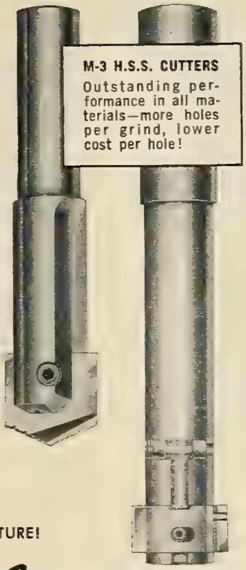
A new series of environment-proof subminiature rotary selector switch assemblies has been announced by Micro Switch Division of Minneapolis-Honeywell Regulator Co.

Small size is combined with complete-seal construction and precision multi-circuit switching. The assemblies, designated the 25AS series, are especially suited for use on aircraft and electronic control panels where space is at a premium. Dependable operation can be obtained in a temperature range of −65° to +212°F, the company claims.

The rotary selectors are supplied with from one to eight of the lightest environment-proof switching units. From two to eight detent positions are offered. The detent mechanism imparts a positive "feel" between each detent. There is a 45° angle between detent positions.

The precision switching units are sealed with an elastomer seal which is bonded to the pin plunger and alumi-

New Clark TOOLS SOLVE HOLE MAKING PROBLEMS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HIGH-ENERGY FUEL BRIEFS FROM CALLERY

The Callery countdown has begun. When it reaches zero, two new fuel plants will stand ready to produce HiCal, trade-name for our high-energy zip fuel. The fuel from both plants will be HiCal 3, a liquid boron-carbon-hydrogen fuel for aircraft and missiles.

PLANT CONSTRUCTION ON SCHEDULE
One of two new plants is under construction at Muskogee, Oklahoma; the other at Lawrence, Kansas. Both plants are on schedule. The first units of the Callery-financed Lawrence plant were put into operation on April 1. And the plant at Muskogee — the one we're building for the Navy — should be finished by the end of 1958.

TARGET DATES FOR PRODUCTION
After reasonable lead-time to start the plants up, we anticipate fuel production at Lawrence by mid-1958 and some production at Muskogee early in 1959.

A WORD ABOUT AVAILABILITY
Distribution from the Navy-owned Muskogee plant will be handled by the Navy. No commercial sales foreseeable here. And while the fuel capacity from Callery's Lawrence plant is virtually all committed *now*, there may be quantities of fuel available in the *future* for authorized users.

ALSO ON TAP
We will also produce these other chemicals of interest to the propulsion field: Decaborane, Diborane, Triethylborane, Amine-Boranes and TMB. TMB is a metal fire extinguishent. It is effective against magnesium, zirconium and titanium fires. Still other chemicals of interest — primarily to the chemical industry — will be available in production quantities.

HOW WE CAN SERVE YOU
Although we will be fuel and propellant manufacturers ourselves, we would be very glad to consider *your* expected future large-scale requirements for fuel and propellant intermediates. When need for such materials becomes apparent, please get in touch with us.

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TWX: Perrysville, Pa. 117

Stuart G. McGriff
Product Manager
Fuels and Propellants
Callery Chemical Company

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NEWBROOK MACHINE CORPORATION
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SILVER CREEK, NEW YORK

Circle No. 118 on Subscriber Service Card.

mum housing. The lead wires are embedded in an epoxy casting resin. Multiples of these single-pole double-throw basis switches allow a variety of wiring combinations.

With the seals deliberately broken, each basic switching unit is rated at 3 amperes, 28 vdc, inductive load, sea level; 2.5 amperes, 28 vdc, inductive load, 50,000 ft.

Circle No. 277 on Subscriber Service Card.

Pressure Calibrators For Transducers

Wallace & Tiernan Inc. have developed improved types of precision aneriod and dial type manometers for use as portable calibrators of pressure transducers.

Models of the calibrators have absolute pressure ranges starting at zero to 31.5 in. of mercury absolute and extending as high as zero to 150 inches of mercury absolute. Differential pressure ranges start at 0 to 120 inches of water and extend to 0 to 300 in. of mercury. The accuracy of all models is 0.1% of full-scale range. Readability and sensitivity to pressure change is one part in 10,000 and hysterisis has been reduced to a minimum.

Circle No. 274 on Subscriber Service Card.

High-Speed Pump Features New Gear Design

A high-speed hydraulic pump featuring a new gear design has been introduced by Hupp Aviation Co. Designated the Hupp Hydroid Pump, the unit features gears with an elliptical profile that eliminates trapping of liquid between teeth.

The patented gear design is the first to be developed exclusively for pumping fluids instead of for power transmission, according to the manufacturer. The nontrapping feature permits speeds in excess of 4000 rpm with hydraulic pressures of more than 1500 psi. Flow rates from three to more than 250 gallons per minute are available for specific applications.

Ability to operate at high speeds eliminates need of costly reduction gearing accessories on hydraulic applications. It is expected designs will be tailored for uses where higher pressures, quieter operation and gear pump economy are required.

Circle No. 276 on Subscriber Service Card.

Maintenance Kit Labels Lubrication Points

A plan of preventive maintenance for marking lubrication systems has been developed by the Meyercord Co. of Chicago. The plan provides for positive identification of lubrication points on machine tools, as well as on lubrication equipment and bulk containers. The markings are special type transfers, known as Lubri-Cals. They are resistant to abrasion, weathering, oil immersion and temperature variations. The kit consists of a total of 4276 markings which provide the proper frequency of numerals, letters and instruction nameplates for identifying lubrication points and for specifying the required lubricants for each application. Numerals are placed adjacent to the lubrication point on the machine along with a letter denoting the required lubricant.

Circle No. 275 on Subscriber Service Card.

Readout Counter Has Life of 300 Million Counts

A high-speed electro mechanical switch readout counter with a life expectancy of 300 million counts and offering switch readout function on each point of its five digital wheels has been developed by Autron Engineering, Inc. Now in production the Neuron switch readout counter features rates to 40 counts per second and is available with either manual or electrical instantaneous pulse reset. Also available are models responding to a variety of ac and dc actuation voltages.

Intended for industrial high-vibration and heavy g-load airborne applications, the counter has a bidirectional stepping mechanism which cannot double-index during shock, vibration or overvoltage.

Autron claims the switch contact life is 50 million operations at recommended ratings. Static switch current capacity is 1 amp and the dynamic switch current capacity is 100 milliamps.

Circle No. 278 on Subscriber Service Card.

Printed Circuit Connectors. New contact design eliminates possibility of damage to either contact or circuit board during assembly or multiple insertion. Eversole Associates, Inc.

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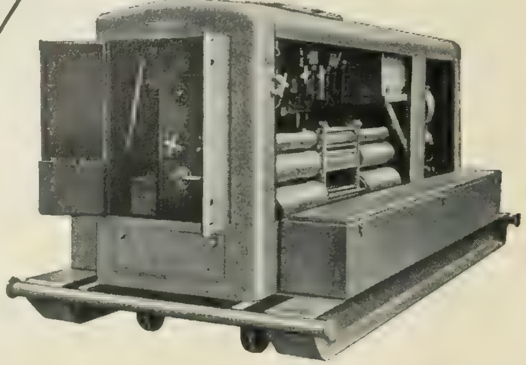

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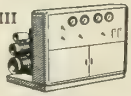

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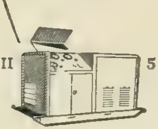

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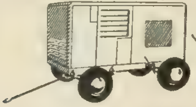

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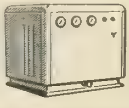

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Lightweight Fuel Control For Missile Powerplants

Chandler-Evans Division of Pratt & Whitney Co., Inc., has developed a series of lightweight low-cost fuel controls for use on small gas-turbine powered missiles and target drones. Known as the model MC fuel control series, each unit is simple in design and incorporates a pneumatic speed governor which enables it to maintain constant speed from sea level to 60,000 feet.

Each unit is a unitized fuel system incorporating a positive displacement gear pump, a metering valve and a bypass valve.

Circle No. 281 on Subscriber Service Card.

Sensitive Transducer Features Reliability

Servomechanisms, Inc. has designed a pressure transducer, designated SMI type TR 719, for conversion of an ac excitation to a dc output signal that is proportional to differential or absolute pressure. The unit has been made for use in telemetry pressures such as aerodynamic, powerplant or hydraulic systems. It can also be employed in various other applications such as the sensor in a dc feedback loop. It is said to be ideally suited for high accuracy and high environmental missile requirements where standard potentiometer transducers exhibit excessive friction, resolution and unreliability.

The unit operates in the ranges from 15 to 3000 psi and the manufacturer states that its design allows accurate and reliable operation under relatively high shock, vibration and acceleration.

Circle No. 282 on Subscriber Service Card.

Power Supply Fills Precision Requirements

A transistorized power supply developed by Southwestern Industrial Electronics Co. has been made available for any desired output between 1 and 25 vdc. Rated output current is 350 ma and the regulation over the entire input voltage and output current ranges is 1%.

The 120 vac input is reduced through a specially designed SIE transformer, rectified in a bridge circuit and filtered. The aluminum case contains output terminal connections, switch, pilot light, and a 0.25v adjustment control on an anodized front panel.

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GRADUATE EE'S: GENERAL ELECTRIC DISCLOSES HIGH PRIORITY PROGRAM FOR ATLAS

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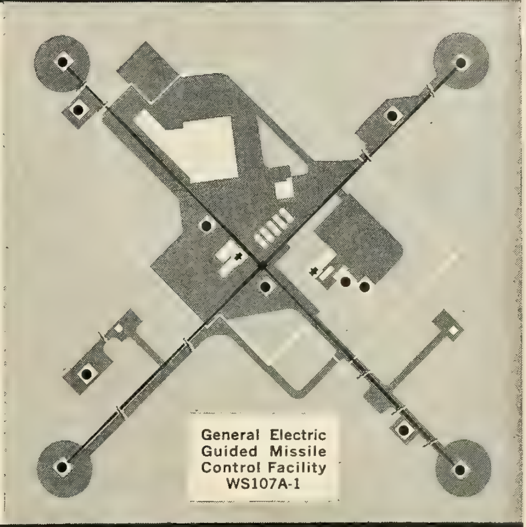

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Guided Missile
Control Facility
WS107A-1

Delivering an ICBM over a > 5000 mile trajectory into the target area demands a guidance system of unprecedented accuracy—and this is the calibre of the electronic system General Electric engineers are creating for ATLAS.

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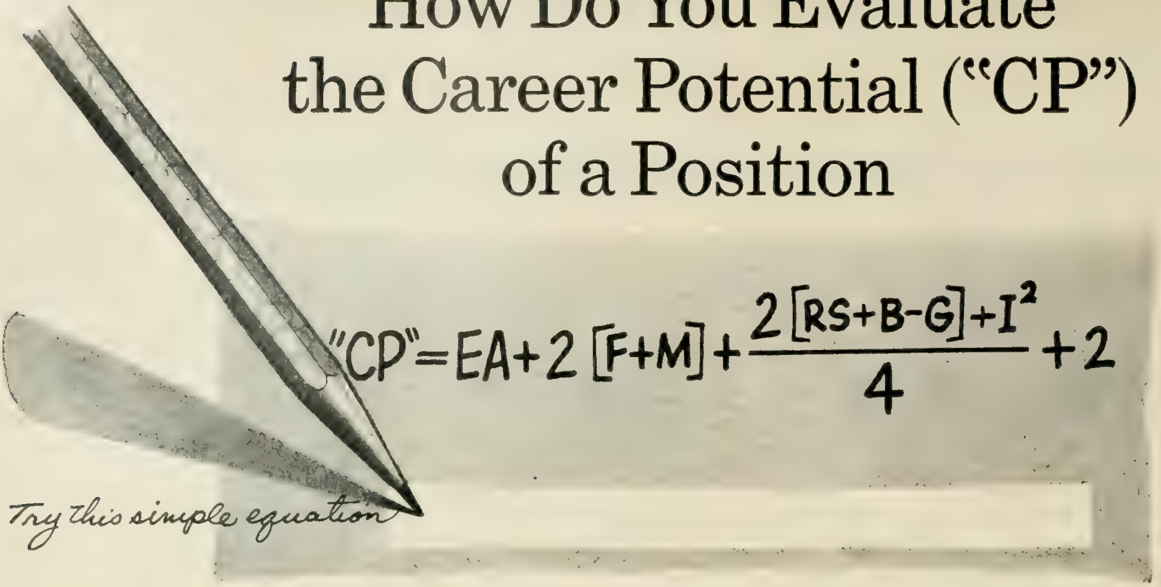

$$\text{"CP"}=EA+2\left[F+M\right]+\frac{2\left[RS+B-G\right]+I^2}{4}+2$$

Try this simple equation

My Present "CP" = ____________

"CP" VALUES; to test your "CP," circle the value you'd give each symbol below, substitute, AND SOLVE. *(Top value obtainable, 99.5)*

	"CP" VALUES	LOW			HIGH
E	Encouragement to Exercise Initiative & Creative Imagination	2	3	4	5
A	Assignment (Nature of)—from Routine to Very Challenging	5	6	7	8
F	Field—Conventional Product to Area where Technical Breakthroughs Expected	2	3	4	5
M	Modern Facilities—from Limited to Extensive Equipment for Testing and Research	2	3	4	5
R	Recognition of Individual Contributions—Chief Reason for Advancement	2	3	4	5
S	Salary—from Unsatisfactory to Excellent for Level of Work	5	6	7	8
B	Benefits—from Limited to Best in Industry, including Encouragement to Join Professional Societies; Liberal Support for Graduate Study	2	3	4	5
G	Increases—Primarily by Seniority Rather than Merit.	2	3	4	5
I	Your Individual Skill, Creativeness and Ability to Take Responsibility	5	6	7	8

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Circle No. 250 on Subscriber Service Card.

SILICONE FLUID. A new methyl phenyl silicone fluid capable of withstanding more than 1000 hours exposure to air at 250°C without decomposing or jelling has been marketed by GE. Designated 81705, the fluid is applicable over the temperature range —40 to 500°F. It has low volatility, high flash point, good electrical properties and good lubricity. General Electric.

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Circle No. 252 on Subscriber Service Card.

MOUNTING SYSTEM. Lightweight standardized mounting system designed for the protection of fuel control equipment from destructive vibration and shock in high temperature propulsion section of missiles. Robinson Aviation, Inc.

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UMBILICAL DISCONNECTS. Designed specifically for missile umbilical disconnects or other severing functions where guillotine choppers are not feasible, this explosive electrical disconnect is designed around the 55-circuit Bendix pygmy connector. It converts the pygmy unit into a reusable explosive-actuated device without altering the electrical characteristics of the original connector. Beckman & Whitley, Inc.

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SHUTOFF VALVE. Manual shutoff valve model 949T for high pressure gas systems materially exceeds valve requirements of MIL-C-2680. Primary features of the valve include easier operation with threads out of fluid stream above the stem seal, reduced operating torque and increased depth of finger indents in handle. Provides positive, leakproof shutoff by means of a resilient O-ring; yet the O-ring is withdrawn completely and automatically from the fluid stream as soon as the valve begins to open. Throttling is accomplished by a conical metal plug which varies the orifice area. James, Pond & Clark, Inc.

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PHASE METER. Phase accuracy of 1° from 10 cps to 10 kc is a feature of a transistorized phase meter designated model 328-A. Operating characteristics include long-time stability, frequency range from 10 cps to 50 kc, direct reading from 0° to 360° in 6 ranges of 60° each on a 5" meter scale, recorder connections and operation from an external 45-volt battery, if desired. Acton Laboratories.

Circle No. 256 on Subscriber Service Card.

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ACCELERATION TESTS. An illustrated folder covering centrifuge acceleration test equipment, giving specifications, performance data and accessory information has been published by the Rucker Co.
Circle No. 200 on Subscriber Service Card.

TAPE RECORDER. Sixteen-page brochure on the model 800 airborne magnetic tape recorder describes the equipment and gives complete specifications and operating features. Photographs and a tabular presentation of the various data requirements are included. Ampex Corp.
Circle No. 216 on Subscriber Service Card.

STAINLESS STEELS. Product data sheet discussing magnetism of wrought and cast stainless steels and its relation to corrosion resistance is available from Alloy Steel Casting Co.
Circle No. 201 on Subscriber Service Card.

THERMO-PANEL COILS. Bulletin describes new type of unit to replace standard pipe coils in heating or cooling processes. The panels consist of two metal plates, embossed and welded together to form flow channels. Bulletin gives design features, price information and various other data. Dean Thermo-Panel Coil Division.
Circle No. 202 on Subscriber Service Card.

SMALL BUSINESS PROBLEMS. Research and problem-solving in small businesses are treated in this report for the Office of Technical Services. Report states that small- and medium-sized manufacturing firms depend to a large degree on the large firms who supply them with raw materials and equipment for the solution of their technical problems. Department of Commerce.
Circle No. 203 on Subscriber Service Card.

CERAMIC FABRICATION. Recently published book representing the combined knowledge of 22 specialists and providing details on both the technical basis and present practice in the field of ceramic fabrication processes. Priced at $9.50, the book is available from John Wiley & Sons, Inc.
Circle No. 204 on Subscriber Service Card.

POLYETHER FLEXIBLE FOAMS. Technical bulletin containing six pages of new fundamental data on the formulation, preparation and curing of polyether flexible foams, together with a summary of the properties and performances of the resulting products. Data is given in tabular form and a 90-day graph on the effect of humid aging is included. National Aniline Division.
Circle No. 205 on Subscriber Service Card.

ALUMINUM SHEET AND PLATE. Illustrated 320-page volume includes aluminum's characteristics and practical application for a variety of sheet and plate fabricated parts and assemblies. Book describes aluminum's availability, physical and chemical attributes, production methods and alloys. Kaiser Aluminum & Chemical Sales, Inc.
Circle No. 206 on Subscriber Service Card.

TUBE FORMING. Catalog covering tube-forming facilities of Aeroquip Corp. and giving case histories of customers' tube requirements and fulfillment by Aeroquip. Engineering data, design hints for engineers and illustrations of tube-producing machinery are included. Aeroquip Corp.
Circle No. 207 on Subscriber Service Card.

PERMANENT MAGNETS. Loose-leaf style illustrated handbook fully covers the nature, characteristics and economic uses of permanent magnet materials. It contains sections on permanent magnet design, magnetic measurements, theory of ferromagnetism, and electromagnetic theory, among other subjects. Includes a 125-page specifications and data section presenting nominal magnetic, physical and mechanical data as well as other information. Supplemental data will be mailed to keep the volume up to date. Crucible Steel Co. of America.
Circle No. 208 on Subscriber Service Card.

MISSILE TRACKING CAMERA. Full technical details on the Gordent 200 camera which measures 6" long, 3½" high x 2½" wide. Camera is intended for missile tracking, testing and airborne flight-data recording. Literature covers high-speed magazines as well as optical and other accessories. Gordon Enterprises.
Circle No. 209 on Subscriber Service Card.

PRINTED CIRCUITS. Booklet listing some suggestions on printed circuit layout and design. Based on production experience and incorporating information not readily available in standard literature. Ansley Mfg. Co.
Circle No. 210 on Subscriber Service Card.

RUBBERIZED ABRASIVES. Industrial catalog lists rubberized abrasives for deburring, smoothing and polishing operations. Describes nature, uses and other data on product. Cratex Mfg. Co.
Circle No. 211 on Subscriber Service Card.

CALIBRATOR & TESTER. Four-page brochure details performance and specifications of impact wrench calibrator and tensile tester. Describes uses in checking fastener strength, calibration and maintenance of power wrenches, and setting assembly torque standards. Skidmore-Wilhelm Mfg. Co.
Circle No. 212 on Subscriber Service Card.

FREQUENCY MEASUREMENTS. Data file 111, describing methods of measuring low to UHF frequencies, rotational velocity, flow, pressure, temperature and strain. Covers telemetry and setting up secondary standards of frequency. Uses graphs & charts liberally. Beckman/Berkeley Division.
Circle No. 213 on Subscriber Service Card.

ELECTRONIC REQUIREMENTS. A guide to environment design requirements in research and development of electronic parts has been prepared by the Defense Department. The volume deals with related test procedures, components under nuclear radiation, missile components and highly specialized components. Data is given for temperature, pressure, moisture, vibration, shock, acceleration, explosive atmosphere, sand and dust, salt atmosphere, flammability, nuclear radiation and fungus resistance. OTS, Department of Commerce.
Circle No. 214 on Subscriber Service Card.

MECHANICAL RUBBER. Bonding of molded mechanical rubber to metal (including aluminum), compounding of rubber for tailor-made jobs, and uses of metals when cushioned with rubber where metal-on-metal cannot be used, are described in a 24-page illustrated booklet available from Henry Engineering Co.
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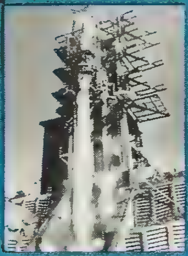

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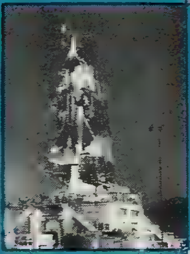

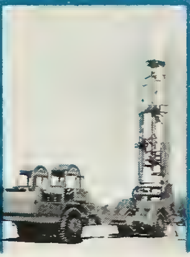

missiles and rockets

MAGAZINE OF WORLD ASTRONAUTICS
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MID-APRIL 1958

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by HOUDAILLE

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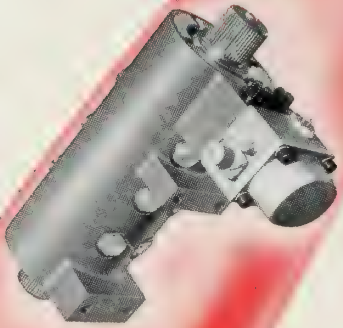

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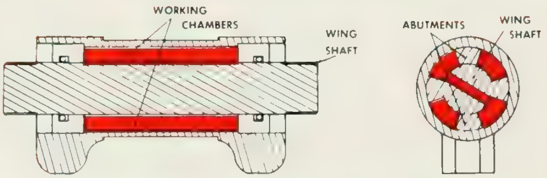

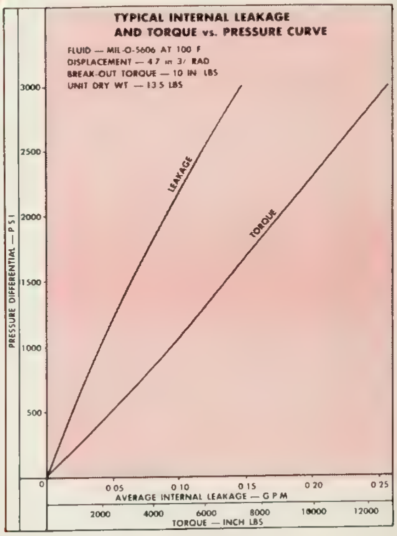
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DISPLACEMENT — 4.7 in 3/ RAD
BREAK-OUT TORQUE — 10 IN. LBS
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135
142
DANGER
REMAIN CLEAR

Bendix-built Talos Guided Missiles on the Navy's "U.S.S. Desert Ship" at White Sands Proving Ground—Official U.S. Navy Photo.

HOW THE MANY BENDIX MISSILE CAPABILITIES ARE IMPORTANT TO NATIONAL DEFENSE

Bendix* has been meeting and solving missile problems for many years. In addition to building the Talos, a U. S. Navy ground-to-air missile, we engineered and developed many of the major systems used in other key missiles. These include warheads, target-seekers, propulsion devices, controls, guidance and telemetering systems. Telemetering systems enable missiles to send back reports from space. More than 500 different channels of information can be transmitted, such as speed, direction, acceleration, roll, vibration, temperature, etc.

The Talos, for which Bendix is prime contractor, has, according to a Navy statement, "demonstrated a remarkably high degree of accuracy and reliability". As a result, the Navy is making direct shipboard installations on first-line cruisers without the intervening step of evaluation. This has meant a considerable money saving and has advanced this missile as a fleet weapon. It will be the major armament of the United States cruiser *Galveston* and will also be installed on a number of other cruisers, including the nuclear-powered *Long Beach.*

Because of the accuracy and extreme range of the Talos, the U. S. Army is also studying the feasibility of incorporating it into the Continental Air Defense System.

In addition to missiles and missile components, Bendix manufactures important Ground Support systems and devices.

Looking to the future, Bendix is engaged in an intensive *long-range* program, designed to help keep America foremost in the development of weapons vital to the preservation of our security and world peace.

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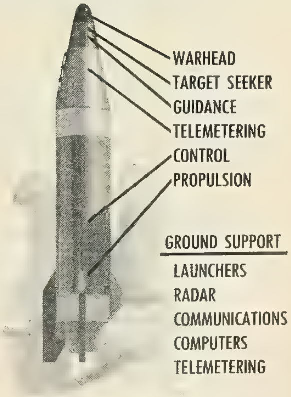

Bendix furnishes major elements for missiles of all types. This illustration represents no particular missile, but shows the general location of various airborne Bendix systems and their components. In addition, Bendix produces the Ground Support systems indicated above.

A thousand products Bendix *a million ideas*

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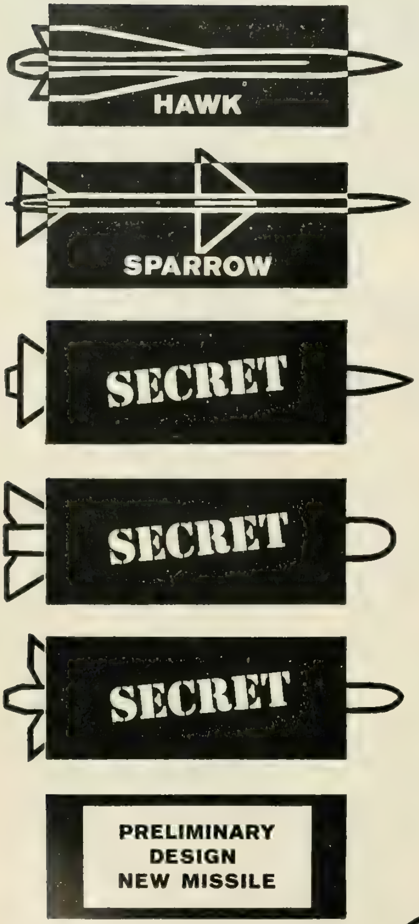
Missile Program



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missiles and rockets

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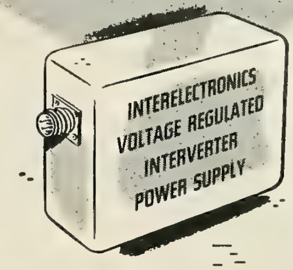

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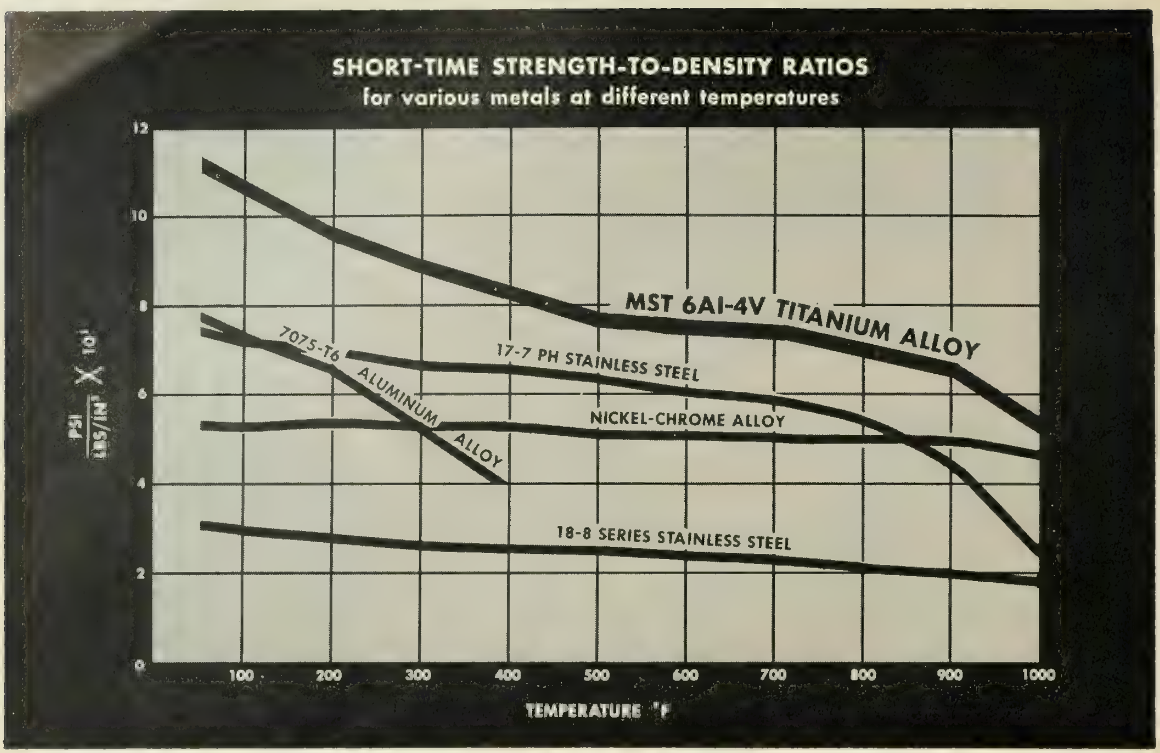

TITANIUM ON TOP

in medium-high temperature range

Today's most popular titanium alloy, MST 6Al-4V, excels all other metals in strength to density ratio through 900°F. At room temperature, considering only strength, a part made of this alloy need have only 60% of the weight of the equivalent part in stainless steel.

Performance for extended times at elevated temperatures is likewise good. In typical creep tests, with 1% permanent deformation allowed, MST 6Al-4V alloy shows 100,000 psi allowable stress at 750°F for 1 hour; 77,000 psi at 100 hours; 65,000 psi at 1000 hours.

Meanwhile new alloys extending the elevated temperature usefulness of titanium—to as high as 1000°F—are now emerging from the laboratory into production.

Write Dept. C-5 for copy of "Titanium Alloy Properties"

SELECTION GUIDE TO MST ALLOYS

Typical Mechanical Properties of Annealed Titanium and its Alloys

	Form	Ultimate Tensile Strength, psi	Yield Strength, psi	Elongation %*
COMMERCIALLY PURE TITANIUM				
MST Grade III	Sheet, Bar	70,000	50,000	25
(3 different strength levels)	Sheet, Bar	85,000	65,000	23
	Sheet, Bar	100,000	80,000	20
TITANIUM ALLOYS				
MST 6Al-4V				
Annealed	Bar	140,000	130,000	15
Age hardened (1)	Bar	165,000	155,000	12
Age hardened (2)	Bar	180,000	165,000	10
Annealed	Sheet	140,000	125,000	12
MST 3Al-5Cr	Bar	155,000	145,000	13
MST 4Al-4Mn	Bar	150,000	140,000	14
MST 8 Mn	Sheet	137,000	125,000	16

(1) 1650°F—1 hour—WQ; 1100°F—2 hours—AC
(2) 1700°F—1 hour—WQ; 1000°F—8 hours—AC

WQ—Water Quench
AC—Air Cool

* Values for 1" on bar and 2" on sheet

MALLORY-SHARON

METALS CORPORATION · NILES, OHIO

Integrated producer of Titanium • Zirconium • Special Metals

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How to Use the Missile Market Guide and Directory

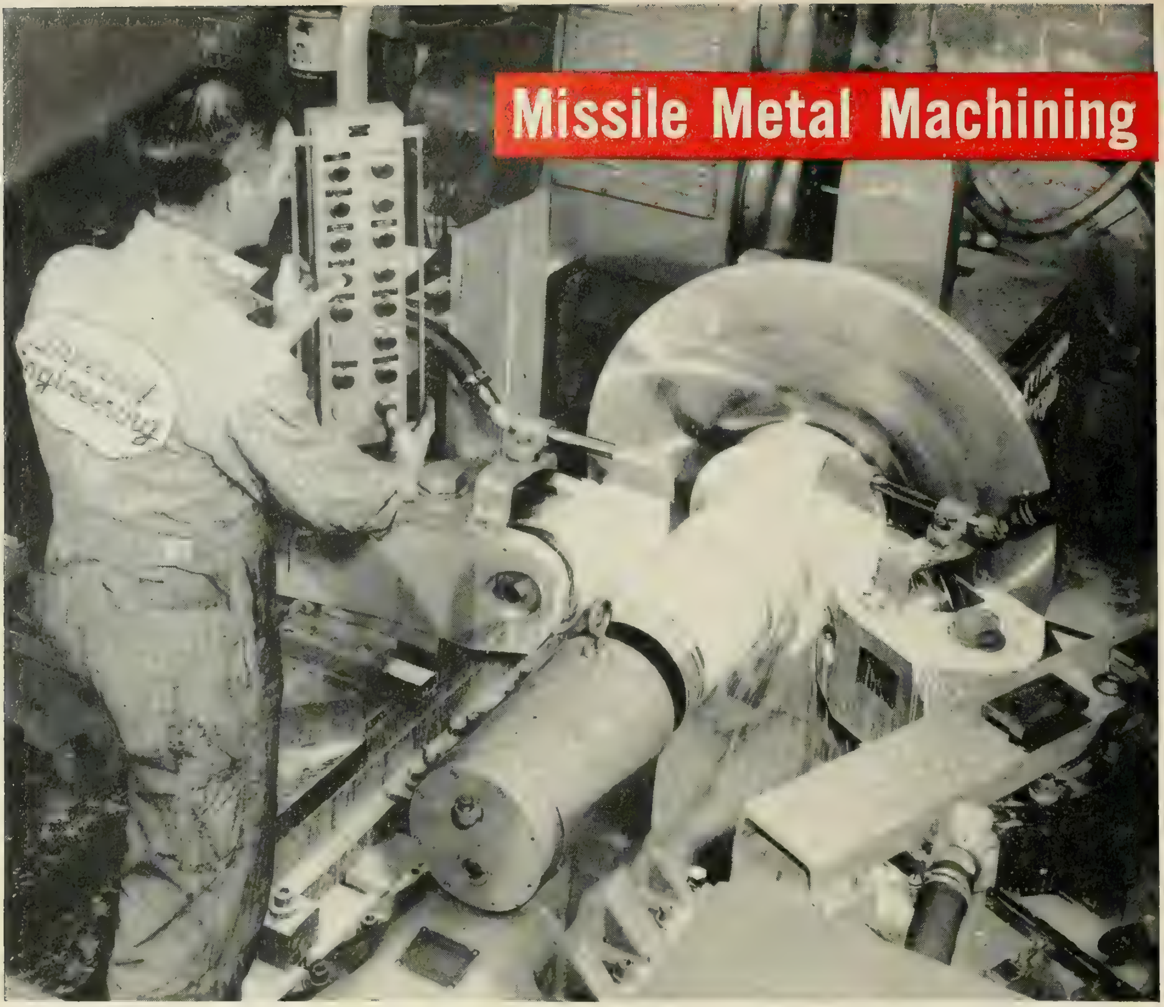
Products listed in the MISSILE CATALOG have been divided into nine major categories (listed above) for the convenience of the user. If you are interested in a particular item in one of these major headings, refer directly to the section desired. Products are listed alphabetically by section.

Certain products are listed under several major categories. You should refer to the PRODUCT CROSS INDEX (beginning on page 444) where you will find listed the page numbers of all products listed in the Directory.

To locate the company name, address, and key purchasing and sales personnel of a supplier, refer to the MISSILE PURCHASING DIRECTORY (page 33).

Type of company activity is explained by the coding at the end of each listing in the MISSILE PURCHASING DIRECTORY. Codings are explained at the bottom of every right hand page.

NOTE: Throughout the issue, advertisers are identified by **bold face** listings.



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At Diversey you have the LARGEST FACILITIES for your missile metal machining problems. Diversey again displays progressive leadership by their accumulated experience in this new art of hydrospinning. Diversey is available for study on your hydrospinning problems. Now you can bring your hydrospinning jobs to Diversey as well as your missile metal machining jobs.

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METAL
MACHINING
Diversey

LEADERS IN CONTOUR MACHINING

Diversey ENGINEERING COMPANY

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FRANKLIN PARK, ILLINOIS • *A Suburb of Chicago*

FROM NOSE TO NOZZLE, FROM FIN TO FIN, CONTOUR TURNED PARTS—WITH PRECISION BUILT IN

This Is The Missile Business

A missile is only as good as an industry. Two years ago there was no such thing as the missile industry—or at least nobody recognized it as such. At that time, missiles were fascinating-to-frightening sidelines of the old, established aircraft industry. But it soon became apparent that these were an entirely different breed of bird.

While aircraft are manned, missiles are not. While aircraft are ribbed, skinned and riveted, missiles—more-often than not—are forged, machined, welded and heat-treated. While aircraft must be designed to live long and relatively stable lives, missiles live only a few very hectic moments. While aircraft make repeated flights, missiles only sit and wait.

That missiles and rockets are "different" is now an accepted fact. And even as they are different, so is the industry that produces them. Though this industry includes many companies from the aircraft industry, it also includes a great and growing number of other companies that had little, if anything, to do directly with aircraft. Estimates of the number of companies intimately concerned with rockets, missiles and space flight run to many thousands, depending on just where you draw the line. The number that want to get into the business runs even higher.

This is a burgeoning industry. Its rate of growth has been extremely rapid, but is nothing compared to what's in store. In less than a decade, the "missile market" has rocketed from practically nothing to over $3.5-billion today, prospects of $7-billion in another three years and some $20-billion or more by 1970—for military purposes alone. Who knows what the civil market may be?

This is the first industry in all history whose prospects embrace the infinite. This year rockets will be launched at the moon. Within five years instrumented probes will be fired at Mars and Venus. Within 18 months, man himself will travel in space—if only for short periods of time—in a rocket powered vehicle that can scarcely any longer be called an aircraft. Within 10 years, man will be patrolling the immediate environment of earth—out to, say, 40,000 miles—in operational military space craft.

Never have the mind of man and his technologies been called upon to produce so much of such importance in so short a time. Yet on performance under these rigorous requirements depends the future of free men everywhere. For, we are not alone in our strivings into space. The Union of Soviet Socialist Republics, already well advanced in the art of astronautics, suffers no illusions as to the economic, political and military potentials that lie beyond our ecosphere.

The race into space is a race for survival. How well we do depends more than ever on the industry that supplies the ideas and translates them into tools we can use. It has been said that rockets, missiles and space flight is an art struggling to become a science. And so it will be for some time—so long as requirements continue to fall within that range that constitutes the dim limits of human knowledge.

But money as well as brains are involved. The industry must not only conceive and manufacture the impossible, it must do it at a reasonable cost in dollars and industrial resources. This is not an easy task, but nobody with any experience at all has ever suggested that it was. It is, however, a job that must be done.

This is the Market Guide—another service by MISSILES & ROCKETS to its industry. In the following pages are over 76,000 company product listings. Over 3,000 companies are named.

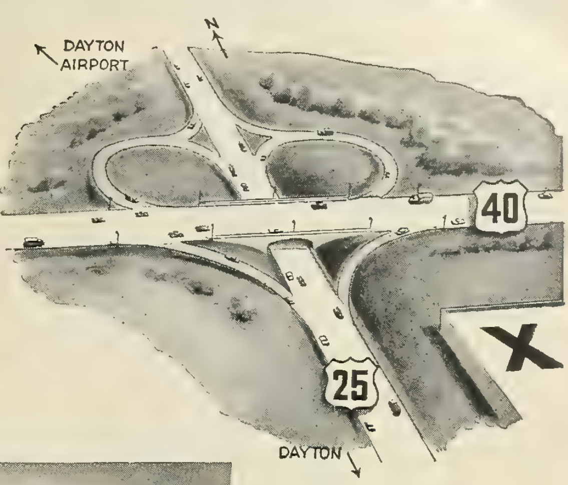
Need an idea, a system, a component, a small part or an inspiration? Somewhere in these pages are the companies that can supply them. They are the vanguard of this growing industry. Their job: to deliver the goods—the right quality at the right time and the right price. Theirs is the responsibility for survival.

Wayne W. Parrish

A NEW AIRCRAFT PRODUCTS PLANT...

THE LELAND ELECTRIC COMPANY
Division of
AMERICAN MACHINE & FOUNDRY COMPANY

AT AMERICA'S AVIATION CROSSROADS



At Vandalia, Ohio, the Leland Electric Company has brought together under one roof, a complete research, development and production facility for aircraft electrical accessories.

Here highly trained personnel with widely diversified skills meet the thousands of complex problems that arise in the manufacture of precision aircraft products.

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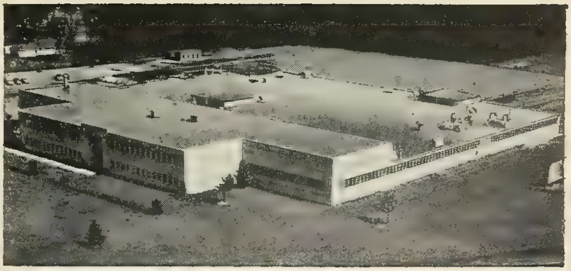

The increasing demand for Leland Aircraft Products "built" this plant. Tried and proven Leland products of today . . . and history-making Leland products as yet unknown . . . will be produced here. Today, tomorrow, why not meet *your* contract needs through Leland?

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Shafer Bearing Division, CHAIN Belt Company,
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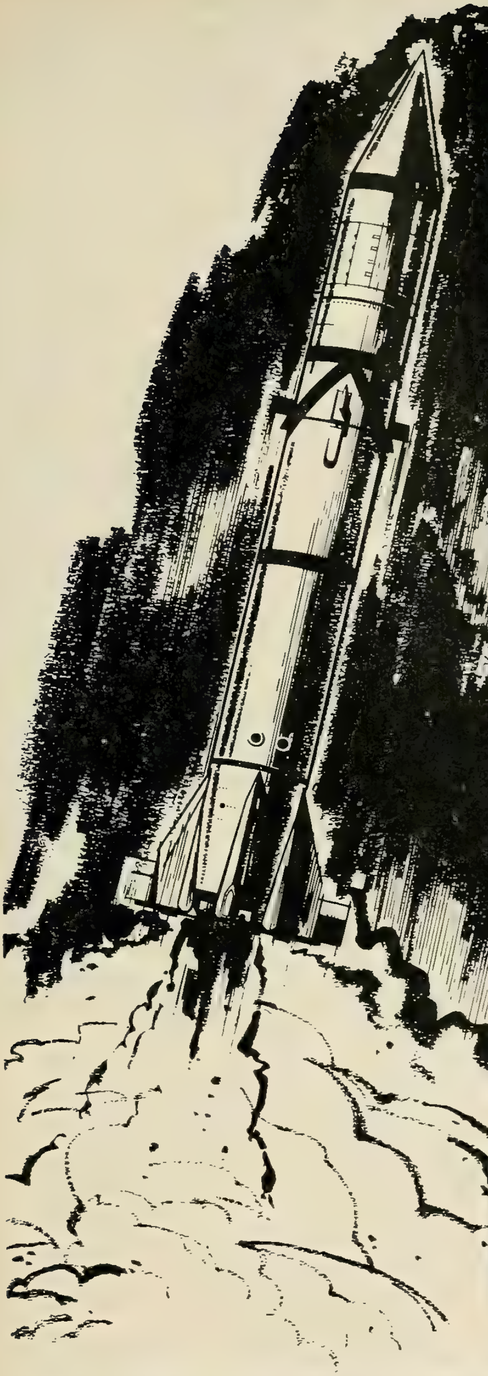

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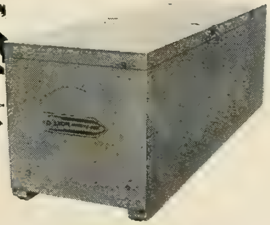
Chief Engineer and Production Manager



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This rocket-powered guided missile can extend the penetration ability of SAC crews since it is launched and accurately directed on its mission while the bomber which carries it remains many miles away from the target area.

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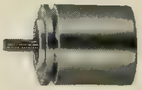
Electrical Characteristics:					
Frequency (cps)	400	400	400	400	400
Torque at Stall (oz. in.)	.15	30	.63	1.45	2.35
No Load Speed (rpm)	6500	6500	6500	5200	5200
Speed at Half Torque (rpm)	4000	4000	4000	3200	3200
Time Constant (sec.)	0.03	0.015	0.016	0.017	0.013
Reversing Time (sec.)	0.051	0.025	0.028	0.030	0.022
Theo. Acceleration at Stall (rad/sec²)	22500	45000	41500	31000	40000
Operating Temp. Range (°C.)	−54 to +125	−54 to +125	−54 to +125	−54 to +125	−54 to +125
Slot Effect	1.6v/26v	1.0v/36v	1.0v/40v	1.0v/40v	1.0v/40v
Duty Cycle	Cont.	Cont.	Cont.	Cont.	Cont.
Fixed Phase					
Voltage	26	115	115	115	115
R (Stall) Ohms	196	1270	1250	490	280
X (Stall) Ohms	183	1560	1780	890	570
Z (Stall) Ohms	268	2210	2175	1030	640
P.F. (Stall)	0.73	0.57	0.58	0.49	0.45
Effective R (Stall) Ohms	366	3840	3800	2160	1460
Parallel Tuning cond. for unity P.F. (Stall) Mfd.	1.0	0.13	0.15	0.33	0.55
Control Phase					
Voltage	40/20	40/20	40/20	40/20	40/20
*R (Stall) Ohms	480	124	145	58	39
*X (Stall) Ohms	445	215	204	103	77
*Z (Stall) Ohms	660	248	250	118	86
*P.F. (Stall)	0.73	0.50	0.58	0.49	0.45
*Effective R (Stall) Ohms	910	495	430	240	190
*Parallel Tuning cond. for unity P.F. (Stall) Mfd.	0.4	1.4	1.3	2.9	4.1
Mechanical Characteristics:					
Rotor Inertia (gm. cm²)	.47	.47	1.07	3.3	4.0
Weight (oz.)	1.2	2	4.5	8	14
Mounting Type	Synchro	Synchro	Synchro	Synchro	Synchro
Motor Length	.863	.672	1.703	1.625	2.03
Type Shaft	Pinion	Pinion	Plain	Plain	Plain
Shaft Extension	.375	.218	.437	.540	.540
Outside Diameter	.750	.937	1.062	1.437	1.750
Type Connection	Leads	Terminals	Terminals	Terminals	Terminals

*For 40v connection



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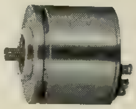

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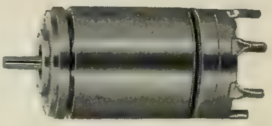

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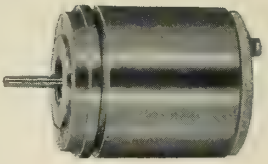

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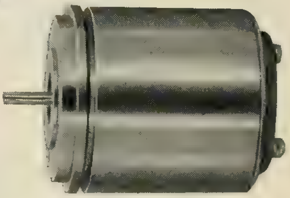

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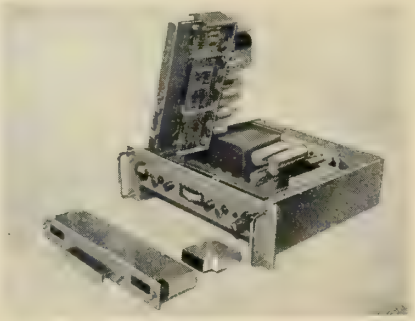

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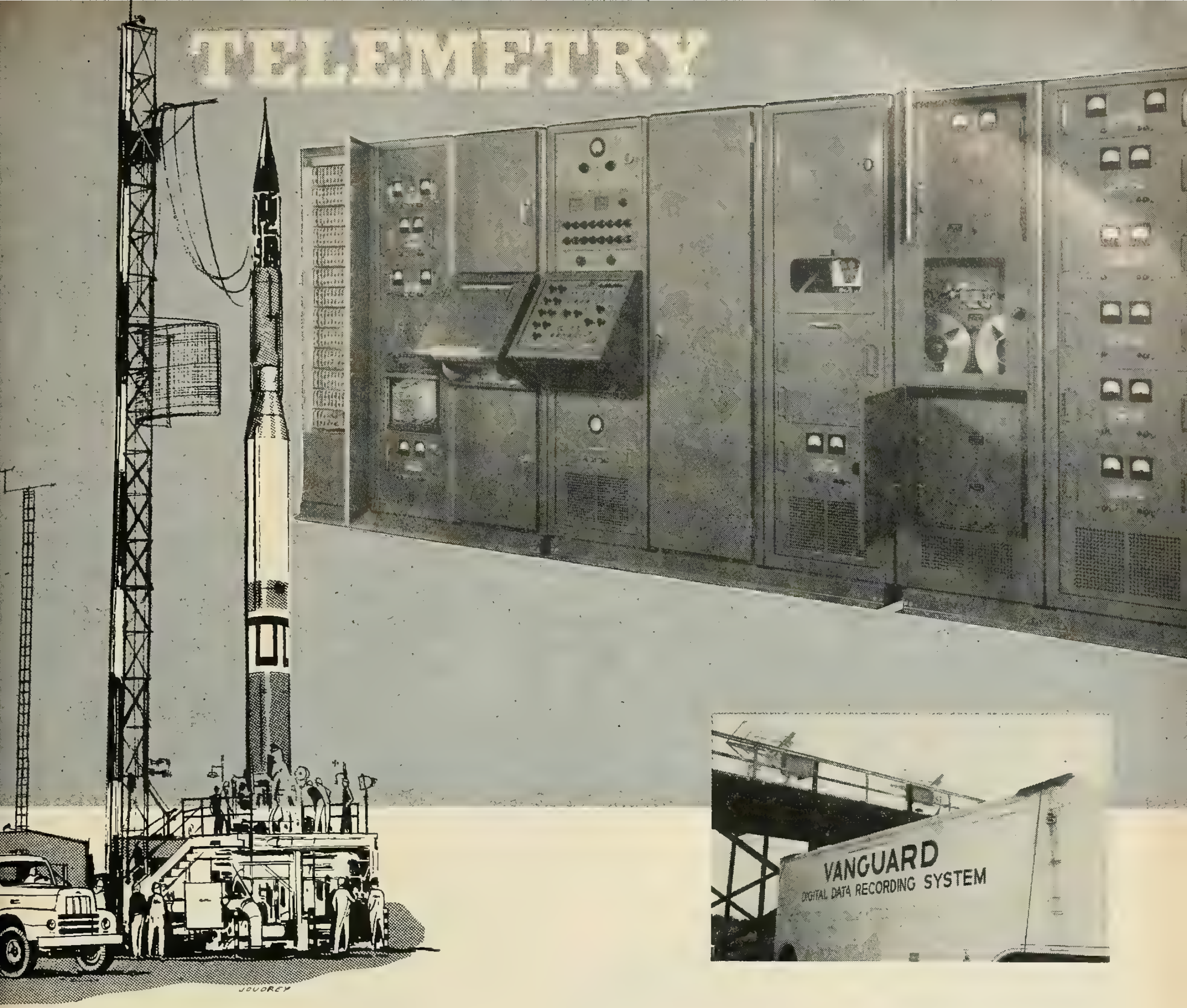

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How to Do Business with the DEPARTMENT OF DEFENSE

Doing business with the Defense Department or its contractors has been of increasing importance with the development of new missile markets. How important this potential is can be illustrated best by a look at the Pentagon plans and programs and how they have grown.

In the year ending June 30, 1957, the Defense Department's obligational program for missiles of all types amounted to $4.47 billion including the cost of bringing missiles to operational status, plus the cost of procuring missiles for operational purposes. These figures included all procurement, construction, research and development funds directly associated with missile programs. Programmed obligations for fiscal 1958 total $5.06 billion including supplemental appropriations and, in fiscal 1959, current programmed obligations including recently submitted budget amendments are now estimated at $6.3 to $6.4 billion.

Actual expenditures for missiles out of major procurement and production funds totalled $2.095 billion in fiscal 1957. In fiscal 1958 expenditures are estimated at $3 billion and in fiscal 1959, Defense Department expects to spend at least $3.5 billion and perhaps more. The figures do not include funds charged to research and development accounts.

• **Analyze Sources**—There are many ways in which a small (500 employees or less) manufacturer can approach the problem of obtaining some of this vast amount of business. But unless he goes about it properly, he can waste an inordinate amount of time.

All services maintain offices throughout the country designed to help businessmen who offer their services to the government. Each one of these offices has a Production Division that includes an Industry Cooperation Officer.

The Industry Cooperation Officer is there to advise on all aspects of procurement. He maintains close liaison with prime contractors in his area and is often able to provide information of suitable local subcontract opportunities.

In addition, the U.S. Department of Commerce publishes what it calls "Synopsis of U.S. Government Proposed Procurement, Sales and Contract Awards" that provides information on prime contract opportunities as well as subcontract opportunities.

The "Synopsis" may be obtained at Department of Commerce field offices throughout the country or by subscription from the Department of Commerce, 433 West Van Buren St., Chicago, Ill.

Other federal agencies, such as the Small Business Administration, maintain regional offices in the principal industrial areas of the country. They attempt to keep current information on the activities of Defense contractors.

• **Analyze Facilities**—Before deciding which prime contractors should be approached, the subcontractor must carefully analyze his own shop to determine the items he might be able to produce. This seems elementary, but a surprising number of firms fail to do this before they set out on a hunt for government business.

Questions that should be answered include: Can you do rough or precise machining? Is your shop arranged for mass production or is it better suited to job-lot type of production? What other types of work could be done if you added a few additional pieces of equipment?

Having analyzed his facilities, there are 10 suggested steps a manufacturer should take in seeking an order from a prime contractor:

Investigate the advisability of combining your facilities with those of other concerns to increase or supplement your productive capacity.

Decide what you want to make. Prepare a statement or brochure about your company and its facilities, listing those items you prefer to make.

Recognize that you have a selling job to do that will require the same sort of sales effort you put into civilian operations.

Communicate with the appropriate sources for information on current subcontract opportunities in your area.

Seek out the prime contractor who appears to have the greatest need for your facilities and products.

Submit information on your facilities and experience to the prime contractor, preferably in a personal call, so that you can discuss specific details.

Allow a reasonable time to pass between your inquiry and a reply. If the prime contractor is in the early planning or production stages, he may not be immediately ready to enlist the services of subcontractors.

If you receive an order, learn how the prime contractor expects you to function. This includes such activities as tooling, submission of production samples, deliveries and engineering changes.

Prepare for termination of the military subcontract work by keeping up some civilian operations.

Businessmen, large and small, should study the legal problems carefully before entering into any contract with the government. It would be advisable, in fact, to retain an attorney with experience in this type of contractual agreement and obligation. ★

How to Do Business with the DEPARTMENT OF THE ARMY

UNITED STATES OF AMERICA WAR OFFICE
MDCCLXXVIII

* * *

Contractors who desire to participate in the U.S. Army Research & Development programs should follow two steps: (1) be sure that a complete presentation is prepared and, (2) submit it to the proper source.

There are four important steps to insure that a complete presentation is properly prepared and correctly submitted. The contractor should first *consider the proposal*—is it related to the Army's R&D activities? Next, he must *identify the proper source of communications*—which of the Army's R&D branches should receive this proposal to insure expeditious handling. Then, *prepare and forward the proposal*—what information and materials should be submitted? Final step is to *arrange a contract*—how are contract arrangements started?

Before he submits a proposal to the Army, the contractor should have a thorough understanding of the Army's research and development requirements. Research is the theoretical or experimental search for fundamental knowledge and control of a particular substance or physical phenomenon. When this search is conducted without any specific goal it is basic research. When it is concerned with a particular problem, it is applied research. The Army supports some basic research, but its greatest financial outlay is in the area of applied research.

Development is the practical application of investigative findings and theories of a scientific and technical nature. It includes the construction and testing of prototype models and devices.

Unless accompanied by an offer of personnel and facilities to undertake further research and development, ideas or inventions that might have military usefulness should *not* be sent to Army R&D. The purchasing or procurement of standard products or components is also beyond the scope of Army R&D activities. These two fields are handled by other agencies.

Inquiries requesting the identity of the proper agency should be directed to: Office of Chief, Research and Development, Department of the Army; Washington 25, D.C., Attn: Technical Liaison Office. This office maintains a list of items and activities with which each of the technical services and commands of the Army is concerned.

Contractors' proposals should be clear and complete and contain the following information in the first letter:

(A) Organizational information—(1) Name and type of company. (2) Total number of employees; also totals of research scientists, development engineers or other technical personnel. (3) Facilities—brief description of laboratory equipment and other facilities suitable for R&D activity (4) Clearance—if the contractor has "facility clearance" from the Army, Navy or Air Force, state which. (5) **Background**—brief outline of work done previously in field of the proposal. (6) Descriptive brochure and financial statement if available.

(B) A clear and full discussion of proposed work in terms of objective and scope.

Should the contractor have no specific project to propose, but merely wishes to list his company as a possible candidate for future work that may develop in his field, an expression of this desire along with the organizational information outlined above would be welcomed by the Office of the Chief of Research and Development.

Final procedure for the contractor is arranging a contract. Most Army R&D contracts result from negotiation rather than from advertising and bids. This is because the government is concerned essentially with buying the competence of individuals and organizations, managerial abilities, techniques and integrity. Contractors are selected on the basis of experience, adequacy of facilities, skill and availability of personnel, quality of workmanship, plant organization, etc., as well as price. The award of a contract is generally by administrative decision based on considered judgment.

If the contractor's proposal is accepted, a contract may be negotiated between his organization and the appropriate agency or subagency. Details regarding the type of contract, calculation of overhead or indirect costs, capital equipment to be furnished by the Army, special stipulation pertaining to contract termination, labor regulations, patent rights, etc., will be discussed and worked out between the contractor and the agency concerned.

If the proposal *is not* accepted, the government *is not* obligated in any way to reimburse the contractor for any costs which he may have incurred in submitting his proposal or attempting to arrange a contract.

Corps of Engineers: Chief of Engineers, Department of the Army, Washington 25, D.C. ATTN: Research and Development Division.

Ordnance Corps: Chief of Ordnance, Department of the Army, Washington 25, D.C. ATTN: Research and Development Division.

Quartermaster Corps: The Quartermaster General, Department of the Army, Washington 25, D.C. ATTN: Office of Research and Development.

Signal Corps: Chief Signal Officer, Department of the Army, Washington 25, D.C. ATTN: Research and Development Division.

Transportation Corps: Chief of Transportation, Department of the Army, Washington 25, D.C. ATTN: Executive for Research and Development.

Chemical Corps: Chief Chemical Officer, Department of the Army, Washington 25, D.C. ATTN: Research and Development Command.

Army Medical Service: The Surgeon General, Department of the Army, Washington 25, D.C. ATTN: Research and Development Division.

Army Ordnance Missile Command: Commanding General, U.S. Army Ordnance Missile Command, Redstone Arsenal, Ala.

Fields of interest:

Corps of Engineers: This Corps has a large part of the ground support equipment for the Army's family of rockets, missiles and satellites. This Corps has the following interests: construction and maintenance equipment, launching towers, bridging and stream crossing equipment, cover and concealment, electrical equipment (generator and convertors), fire-fighting equipment, industrial engines including turbines, industrial gases and compressors, infrared and night vision equipment, liquid fuels distribution (pipe lines), mapping, geodesy and surveying, materials, mine warfare, nuclear power and heating plants, prefabricated buildings, processing and packing, regional influences, snow, ice and frozen ground, special weapons effects and water supply and sanitation.

These R&D fields of interest for the Corps of Engineers are divided among the following: Director, Waterways Experiment Station, Vicksburg, Miss.; Director, Snow, Ice and Permafront Research Establishment, Wilmette, Illinois; District Engineer, Philadelphia District, Philadelphia, Pa.; Commanding General, Engineer Research and Development Laboratories, Fort Belvoir, Va.

Ordnance Corps: This Corps has the following interests: ammunition, artillery, combat vehicles, fire control material, fuels and lubricants, materials, motor transport for personnel and small arms.

These R&D fields of interest for the Ordnance Corps are divided among the following: Commanding General, Aberdeen Proving Ground, Md.; Commanding Officer, Diamond Ordnance Fuse Laboratories, Connecticut Ave. & Van Ness St., N.W., Washington 25, D.C.; Commanding General, Frankford Arsenal, Bridesburg Station, Philadelphia 37, Pa.; Commanding General, Ordnance Tank-Automotive Command, 1501 Beard Street, Detroit 9, Mich.; Commanding Officer, Picatinny Arsenal, Dover, N.J.; Commanding Officer, Watervliet Arsenal, Watervliet, N.Y.; Commanding Officer, Office of Ordnance Research, Box C. M. Duke Station, Durham, N.C.; Commanding General, Ordnance Weapons Command, Rock Island, Ill.; Commanding Officer, Rock Island Arsenal, Rock Island, Ill.; Commanding Officer, Springfield Armory, Springfield 1, Mass.; Commanding Officer, Watertown Arsenal, Watertown 72, Mass.

Quartermaster Corps: This Corps has the following interests: chemicals and plastics, dispensing and handling equipment, aerial delivery equipment, environmental protection, foods, cooking and radiation, individual clothing and equipment, mechanical equipment, test materials and techniques.

The R&D fields of interest for the Quartermaster Corps are the responsibility of the: Commanding General, The Quartermaster Research and Development Command, Natick, Mass.

Signal Corps: The Corps has the following interests: avionics, electronic countermeasures, electronic data-processing systems, ground photography, infrared ultraviolet, meteorological instrumentation, radar, radio and wire communication, radio direction finding, sound and light and television.

These R&D fields of interest for the Signal Corps are the responsibility of the: Chief, Laboratory Procurement Office, The Army Signal Supply Agency Watson Area, Fort Monmouth, N.J.

Transportation Corps: This Corps has the following interests: army aviation, helicopters and fixed wing, marine transport and operation, motor transport, rail transport, terminal operation and structural material for the above.

These R&D fields of interest for the Transportation Corps are the responsibility of the: Commanding Officer, Transportation R&D Command, Fort Eustis, Va.

Chemical Corps: This Corps has the following interests: biological agents, laboratory science, chemical agents, incendiaries, protective equipment, screening agents, smokes and weapons and munitions, chemical, biological, radiological.

These R&D fields of interest for the Chemical Corps are divided among the following: Commanding Officer, Army Chemical Center Procurement Agency, Army Chemical Center, Md.; Commanding Officer, Biological Warfare Laboratories, Fort Detrick, Frederick, Md.; Commanding Officer, Dugway Proving Ground, Dugway, Utah.

Army Medical Service: This Corps has the following interests: basic research in medical sciences, blood, blood derivatives and blood substitutes, dentistry, diseases of animals transmissible to man, internal medicine and equipment, neuropsychiatry and stress, preventive medicine and traumatic surgery, shock and burns.

These R&D fields of interest for the Army Medical Service are divided between the following: Chief, Research and Development Division, Office of the Surgeon General, Department of the Army, Main Navy Building, Washington 25, D.C.; Chairman, Armed Services Medical Material, Standardization Committee, 23rd and E Street, N.W., Washington 25, D.C.

U.S. Army Ordnance Missile Command: This Command has the following interests: drill ammunition for rocket launchers, ground equipment for guided missile systems, guided missile systems, less special weapons material, fuses for rocket and guided missiles, VT Jatos; except propellant, propellant for guided missiles, rockets, excluding warheads, rocket launchers, equipment and/or professional operations in support of: (1) engineering tests, (2) long range research on rockets and guided missiles, major weapons systems (*i.e.* Redstone-Jupiter, etc.) and Army's outer space projects (*i.e.* Explorer).

These R&D fields of interest for U.S. Army Ordnance Missile Command are divided among the following: Commanding General, Army Ballistic Missile Agency, Redstone Arsenal, Ala.; Commanding General, Army Rocket & Guided Missile Agency, Redstone Arsenal, Ala.; Commanding General, White Sands Proving Grounds, Las Cruces, N.M.; Jet Propulsion Laboratories, California Institute of Technology, 4800 Oak Grove Drive, Pasadena 3, Calif.

If in doubt as to which one of the above to write, then direct your query to: Commanding General, U.S. Army Ordnance Missile Command, Redstone Arsenal, Ala.

As mentioned earlier, some aspects of personnel and training R&D are accomplished by the Technical Services and some by other agencies. Thus for research in areas of personnel selection, classification, utilization and assignment write to: The Adjutant General, Department of the Army, Washington 25, D.C.

For research in the areas of personnel training, motivation and leadership write to: Human Resources Research Office, 2013 G Street, N.W., Washington 7, D.C.

For inquiries regarding all other Army research activities in the personnel field write to: Chief, Research & Development, Department of the Army, Washington 25, D.C. ATTN: Director of Research.

Over the period of the last few years, the would-be suppliers to the missile market have had one simple but important complaint—there's no single missile program and therefore no way to hunt down the contracts and bid specifications they need to get in the business.

For the U.S. Army this complaint has been rectified in that the U.S. Army Ordnance Missile Command has been established—give it time to adjust.

THE DEPARTMENT OF THE ARMY

Companies interested in the Department of the Army Guided Missile Program as a prime or subcontractor may utilize U.S. Army Ordnance Corps District Offices as readily accessible points of contact, or to discuss current procurements on a prime contract basis and possible potential subcontracting sources:

Birmingham Ordnance District
2120 North Seventh Avenue
Birmingham, Alabama

Boston Ordnance District
Boston Army Base
Boston 10, Massachusetts

Chicago Ordnance District
209 West Jackson Boulevard
Chicago 6, Illinois

Cincinnati Ordnance District
Swift Building
230 E. Ninth Street
Cincinnati 2, Ohio

Cleveland Ordnance District
Lincoln Building
1367 E. Sixth Street
Cleveland 14, Ohio

Detroit Ordnance District
574 East Woodbridge
Detroit 31, Michigan

Los Angeles Ordnance District
55 South Grand Avenue
Pasadena, California

New York Ordnance District
180 Varick Street
New York 14, New York

Philadelphia Ordnance District
128 North Broad Street
Philadelphia 2, Pennsylvania

Pittsburgh Ordnance District
200—4th Avenue
Pittsburgh 22, Pennsylvania

Rochester Ordnance District
Sibley Tower Building
25 North Street
Rochester, New York

St. Louis Ordnance District
1016 Olive Street
St. Louis 1, Missouri

San Francisco Ordnance District
1515 Clay Street, P.O. Box 1829
Oakland 12, California

Springfield Ordnance District
Springfield Armory
Springfield 1, Massachusetts

How to Do Business with

by Elizabeth Oswald

★ ☆ ★ ☆ ★ ☆ ★ ☆ ★ ☆

The Weapon System Concept is the key to Air Force procurement of guided missiles. This concept calls, generally, for centralization of responsibility in a single contractor for development and ultimately for production of a missile or aircraft. It is known as the industry-AF team approach.

This means that for the most part the weapon system manager is a big company with the resources in both facilities and skills to take on the job. Air Force policy has been to give weapon system responsibility to aircraft companies with which it has done business over the years.

The weapon system contractor under this scheme usually has the responsibility for determining, with AF approval, the subsystem contractors. These, too, are more often than not big companies with proven associations with the AF.

However, AF usually tells the weapon system contractor what part of the project must be subcontracted and inevitably substantial percentages of these subcontracts go to smaller, specialized companies. In this area, AF advises smaller companies to go directly to the weapon system contractor and to do a selling job.

• **Management responsibility** for AF is in a Weapon System Project Office which can help. In the earliest stages of the program, the WSPO is staffed by representatives of the Air Research and Development Command, which has principal responsibility. However, Air Materiel Command will ultimately take over this responsibility when procurement for inventory starts.

Headquarters of ARDC is at Andrews Air Force Base, near Washington, D.C. Ideas and inventions which may have application to Air Force missiles may be submitted for evaluation to the Office of Technical and Industrial Relations of ARDC.

Two other concepts are used by the Air Force for the handling of the development and production of missiles. The first is the special case of the long range ballistic missiles where the AF itself has been the weapon system contractor through its Ballistic Missile Division at Inglewood, Calif. In this case, to provide technical know-how normally supplied by the weapon system contractor, AF employed Ramo-Wooldridge Corp. to supervise the technical aspects of the program.

• **Second concept** is that of "associated contractors." Here there is no weapon system manager as such, but one contractor would be responsible for the missile frame, a second for electronics and perhaps a third for propulsion or ground launching equipment.

AF is now experimenting with still another method of doing business—this is a contractor team approach on the theory that no one company might be capable of providing management and resources needed in the way of both skills and facilities. At least two new projects are being handled in this manner—both dealing with electronic countermeasures. And it is a virtual certainty that the biggest project of them all, the so-called "Dynasoar" boost-glide aircraft designed to put men into space would be developed on this basis, with a special AF agency created to handle AF management responsibilities.

This last concept is considered a potential source of more AF dollars for "smaller" rather than small companies, who could not take on the highly complex program alone. As a result, ARDC is watching current experiments with interest, the big question being whether a group of companies can be so welded together to get the job done.

Not only does weapon system concept dominate AF buying in the missile field but it also plays an important role in the so-called support area—where AF has set up within its own shop a series of support managers.

These support managers are responsible for determination of requirements for spares, both those which are furnished by contractors and those furnished by the government for which contracts will be made. Support manager for the Falcon missile and for the Sidewinder is Middletown (Pa.) Air Materiel Area; for the Rascal and the Green Quail, it's Oklahoma City Air Materiel Area; Bomarc support is from Ogden Air Materiel Area at Ogden, Utah, as is the support for Snark and Bull Goose.

Support managers for the various versions of the Matador and for its latest version, Mace, are at Wright Air Materiel Area. The support manager for Thor, Atlas and Titan is at Mira Loma AF Station, San Bernadino, Calif.

Over the years, it is expected that support managers will buy bits and pieces required for the maintenance of missiles from local sources as well as from original sources of supply.

• **Small business specialists** have been assigned by the Air Force to some 18 Air Procurement District Offices. Companies who want to participate or want to obtain procurement information should contact these offices.

As a reminder, however, Air Force officials explain that construction of missile bases which include in some cases equipment are handled for the most part in the United States by the Army Corps of Engineers as AF agent.

The AF procurement district offices are located at Boston Army Base, Boston, Mass.; 218 Market Street, Newark, N.J.; 111 E. 16th Street, N.Y. 3, N.Y.; 1411 Walnut Street, Philadelphia, Pa.; 912 S. Ervay, Dallas 1, Tex.; 1279 W. Third Street, Cleveland 13, Ohio; W. Warren Avenue & Lonyo Blvd., Detroit 32, Mich.; 54 Monument Circle, Indianapolis 6, Ind.; 20 Symington Place, Rochester 3, N.Y.; 5555 S. Archer Avenue, Chicago 38, Ill.; 770 N. Plankinton Ave., Milwaukee, Wis.; 1114 Market St., St. Louis, Mo.; Building 70, Area "C", Wright Patterson AFB, Dayton, Ohio; P.O. Box 5555, Helen St. Annex, Tucson, Ariz.; 1206 Maple Avenue, Los Angeles, Calif.; 41 Exchange Place S.E., Atlanta, Ga.; and Building 1, Oakland Army Terminal, W. Grand Ave. & Maritime, Oakland 14, Calif.

the AIR FORCE

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Companies now holding prime weapon system contracts with the AF include: Boeing Aircraft Corp., Seattle, Wash.; Convair Div. of General Dynamics Corp., San Diego, Calif.; Douglas Aircraft Corp., Santa Monica, Calif.; Lockheed Aircraft Corp., 2555 North Hollywood Way, Burbank, Calif.; Martin Company, Baltimore, Md., and Denver, Colo.; North American Aviation Inc., Los Angeles, Calif.; Northrop Aircraft Corp., Hawthorne, Calif.; McDonnell Aircraft, St. Louis, Mo.; and Fairchild Engine and Aircraft Corp., Hagerstown, Md.

As matters now stand, the largest part of the Air Force's missile program is controlled by the Air Research & Development Command at Andrews AFB, Md.

- **Office of Scientific Research,** located in Washington, D.C., is responsible for conducting an "exploratory research program." It is divided into seven directorates, each of which are divided themselves into divisions.

These are: Directorate of Aeronautical Sciences, which includes three divisions—mathematics, mechanics and combustion dynamics.

Directorate of Physical Sciences, which includes two divisions—physics and nuclear physics.

Directorate of Research Information, which includes three divisions—technical information and intelligence, presentations, and liaison and analysis.

Directorate of Advanced Studies with two divisions—systems, which deals with atmospheric and extra-atmospheric flight and advanced propulsion systems and, techniques which deals with detection and identification and novel control techniques.

Directorate of Bio-Sciences, with two divisions—aeromedical and behavioral sciences.

Directorate of Material Sciences, with two divisions—chemical and solid state.

ARDC maintains a number of research centers for special programs. These include:

Cambridge Research Center, Bedford, Mass., which carries a broad program of research, development and testing in electronics, geophysical sciences and human engineering.

Wright Air Development Center, Dayton, Ohio. The WADC program includes work in the technical fields of materials, aerodynamics, human engineering, propulsion, flight control, aeronautical equipment, ground support equipment and the airborne parts of reconnaissance, electronic countermeasures, weapons guidance, electronics techniques, communications and navigation.

Air Force Missile Development Center, Patrick AFB, Florida. In addition to its well advertised tests of long range guided and ballistic missiles and target drones, the Center does research and development on test procedures.

Arnold Engineering Development Center, Tullahoma, Tenn., operated by Aro, Inc. The center plans, constructs and operates a series of wind tunnels and high altitude test cells for the test and evaluation of aircraft, guided missiles and air-breathing propulsion systems. The Center, a service organization, does testing for all services and for their industrial contractors.

Special Weapons Center, Kirtland AFB, N.M. Work here is centered on the AF's responsibilities in the development and testing of nuclear and thermonuclear weapons, their components and associated equipment. It also provides backup for AEC in conducting special weapons tests.

AF Missile Development Center, Holloman AFB, N.M. It is assigned research and development of specified guided missile subsystems and components and in biodynamics and space biology. It also supports AF research programs in guided missiles, electronics, geophysics, physiology, biophysics and psychology.

Rome Air Development Center, Griffis AFB, N.Y. The Center develops, tests and provides technical support for ground electronic systems and equipment. These include ground radar, navigation aids, communications, electronic countermeasures and other specialized development. It also places most of the contracts for procurement of electronic support equipment.

AF Personnel and Training Research Center, Lackland AFB, Tex. makes predictions of the personnel requirements which will result from the development of new weapons systems.

In addition to the major centers described, ARDC includes: The Office of Aircraft Nuclear Propulsion; the Armed Services Technical Information Agency, with field offices in Los Angeles, San Francisco, New York, Washington, D.C. and Dayton, Ohio. It also supports a European Office at Brussels, Belgium whose job it is to encourage European scientists to take in research contracts, and to monitor such contracts.

Finally there is the AF Ballistic Missile Division, Inglewood, Calif., which is responsible for managing the AF Thor, Atlas and Titan at this time and the second generation of missiles to follow. Research interest runs from fundamental research to crash hardware programs where bugs are found and the need for an answer is immediate.

Moving out of the research area, and into the "buy program" for inventory, the Directorate of Procurement and Production at the Air Materiel Command, Wright-Patterson AFB, Dayton, Ohio, takes charge. The function of the directorate is to procure, produce, plan, schedule, budget and supervise aerial weapons including missiles, engines, armament and equipment down to the nuts and bolts which hold missile components and aircraft together.

The Directorate buys complete aircraft, missiles, engines, navigational and communications equipment and items which still require extensive engineering work. Under a new theory of decentralization, air materiel areas buy items in their assigned property classes corresponding to the classes for which they have primary supply and maintenance responsibility.

How to Do Business with the DEPARTMENT OF THE NAVY

by **Bernard D. Brown**

★ ☆ ★ ☆ ★ ☆ ★ ☆ ★ ☆

Large and small manufacturers who do business with the Navy, deal principally with three bureaus: the Bureau of Ordnance, the Bureau of Aeronautics and the Office of Naval Research. All three have their headquarters at 18th Street and Constitution Avenue, Washington, D.C.

"The Department of the Navy," said Raymond H. Fogler, former Assistant Secretary of the Navy for Materiel, "has continuously pursued a policy of encouraging maximum subcontracting to small firms by prime contractors. This policy has been repeatedly stressed in official contacts with Navy suppliers and is specifically set forth in all fixed-priced and cost-reimbursement-type contracts for supplies and services in excess of $5000."

During the six-year period beginning in fiscal 1950, small business firms received, through prime contracts, more than $6.7 billion. That figure represented 20.4 percent of the Navy's total direct purchases. Another 20 percent of the Navy's procurement dollars was channeled to small firms through subcontracts placed by Navy prime contractors.

(For a list of prime contractors who are doing or have done business with the Navy, a booklet, *Selling to Navy Prime Contractors* (NAVEXOS P-1030), is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.)

OFFICE OF NAVAL RESEARCH

. . . the directing agency

The Office of Naval Research was established by Congress August 1, 1946, to coordinate scientific research in the Navy.

ONR's activities and responsibilities have steadily increased during the past 11 years, but it is still concerned, primarily, with basic research, rather than applied research.

The Navy's research and development interests are broad, covering nearly the entire spectrum of the sciences and touching almost every industrial field. ONR's basic policy is to provide the means for interbureau and interlaboratory groups to get together.

ONR moves into technical areas that appear critical to the Navy and into warfare areas when the work appears to require integration. It conducts most of the Navy's program of basic research. Most of this basic research is conducted in colleges and universities, although some research is also conducted in commercial and industrial laboratories and in nonprofit laboratories and institutions.

ONR does not conduct all of the Navy's research, however, nor does it conduct much development. Each Navy bureau is responsible for developing items for which it has special technical competence. In addition, the bureaus conduct their own programs of research in direct support of their own developments or their own technical areas.

Occasionally ONR conducts what is called exploratory development: research contractors work on a development until the principle is proved. The project is then turned over to the appropriate bureau.

For example, ONR's Air Branch directs a program which develops and demonstrates fundamentally new concepts in the field of aeronautics, such as the very light one-man helicopter. Later, the concept is fully developed by the Bureau of Aeronautics.

ONR branch offices throughout the country receive contract proposals, but all are finally negotiated in Washington. Branch offices are located in New York, Boston, Chicago, San Francisco, Pasadena and London.

Serving under each branch office are resident representatives at various colleges and universities, including Rochester, Pennsylvania, Pittsburgh, Michigan, Ohio State, Kansas, Texas, Minnesota, Purdue, Washington, California, Stanford, Johns Hopkins and the Georgia Institute of Technology.

ONR also has field stations such as the Naval Research Laboratory in Washington; the Special Devices Center at Sands Point, Port Washington, N.Y.; the Underwater Sound Reference Laboratory at Orlando, Fla., and the Naval Biological Laboratory at Oakland, Calif.

In addition, any qualified person, educational institution, nonprofit organization or business firm may submit a research proposal to one of ONR's seven science divisions: Earth Sciences, Material Sciences, Physical Sciences, Mathematical Sciences, Biological Sciences, Psychological Sciences and Naval Sciences.

Each of these divisions is divided into branches. For example, the Physical Sciences Division has a Physics Branch, a Nuclear Physics Branch and an Electronics Branch. An electronics engineer or scientist who has a research proposal to make would be well advised to talk it over with the director of the Physical Sciences Division or the Electronics Branch. He may find that research is already underway on a similar proposal, or that his proposal is unique, has merit, will be seriously considered and a contract for its performance issued.

What applies to the individual also applies to representatives of organizations, whether profit or nonprofit, who wish to do business with the Office of Naval Research.

BUREAU OF ORDNANCE

. . . *armament developer*

The Bureau of Ordnance is responsible for the design, development, research, operating standards, manufacture, procurement, maintenance, distribution, repairs and disposition of all arms and armament employed by the Navy.

That includes, in addition to guns, armor, torpedoes, mines, depth charges, pyrotechnics and bombs, rockets and certain guided missiles and special weapons, ammunition, war explosives and chemicals. It also includes defensive nets, booms and buoys, anchors, moorings, propellants and appliances for these items and, except as specifically assigned elsewhere, optical and other devices and material for the control of guns, torpedoes and bombs.

BuOrd also has responsibility for maintenance, control, upkeep and operation of naval ordnance activities (depots and the like) which house these armaments.

Just how important is BuOrd in the total Navy missile picture? Of the five Navy guided missiles now operational, four were developed under the direction of the Bureau of Ordnance.

BUREAU OF AERONAUTICS

. . . *develops aircraft & missiles*

The Bureau of Aeronautics is responsible for the design, development, procurement, production, test, fitting out, maintenance, alteration, repair and material effectiveness of Navy and Marine Corps aircraft, target drones, certain guided missiles, including components and equipment. It is also responsible for research and other pertinent functions related to these activities.

In addition, BuAer contracts for naval aircraft and technical or specialized aviation equipment and, most important, provides plant facilities and schedules for the production of these items.

BuAer also collaborates with the Bureau of Yards and Docks in design, construction and alteration of all aeronautic shore establishments.

The Bureau outfits and replenishes with aeronautical equipment and material all bases afloat and ashore from which naval aircraft operate, and supervises the service, repair, overhaul and salvage of naval aircraft and aviation equipment.

Procurement Items Listed by Responsible Office

NAVY PROCUREMENT OFFICES

BUREAU OF AERONAUTICS, Dept. of Navy, Washington 25, D. C.
Procurement Items: Propellers; aircraft launching equip.; electric aircraft actuators; electric cabin and cockpit heaters; tow target releases; barrier materials; catapults; aircraft loading ramps; energizers; radio communications equipment; beacons; beams; control tower equipment; direction finder groups; airborne radio navigation and air traffic control equip.; oscillators; airborne radios and equip.; ground radios and equip.; airborne navigation instrument transmitters; intercommunication equip.; radar equip.; airborne detection sets; altimeters; amplifiers; computers; direction, distance, elevation and range indicators; misc. meters; modulators; sonar; radiac equipment; infrared; switches; headsets; microphones, speakers; electric motors; electric control equip.; electric generators and generator sets; aircraft fuel systems components, booster coils, distributors, engine generators, ignition harness assemblies, magnetoes, manifold assemblies, engine starters, engine pumps, engine coolant radiators, engine filters, turbosuperchargers, engine control quadrants; fire trucks, hose, reels, trailers; aircraft sextants; aircraft compasses; accelerometers; altimeter indicators; controls, gyros, asemblies, regulators, valves and servos; gages and gage assemblies; indicators; fuel flow transmitters; misc. aircraft meters; oscillographs; oscilloscopes; weather balloons; indicators, computers, recorders; aviation seaplane and barrier deck lighting fixtures; ladders; aircraft test stands; engine test cell equipment; shop equipment; aircraft training aids.

BUREAU OF ORDNANCE, Dept. of Navy, Washington 25, D. C.
Procurement Items: Electron tubes; transmitters; rectifying crystals; dry cell batteries.

BUREAU OF SHIPS, Dept, of Navy, Washington 25, D. C.
Procurement Items: Unmounted antifriction bearings; plain unmounted bearings; books and pamphlets; telephone, telegraph, teletype, facsimile, radio communications, intercommunication equip.; sound recording and reproduction equip.; radar equip.; sonar; radiac equipment; infrared; electron tubes, transistors and rectifying equip.; antennae, wave guides and related equip.; electric motors; electric control equipment; dry cell batteries; electric wire and cable; misc. power equip.

(Cont'd on page 27)

Purchasing Locations and Chief Officers

Chief, Bureau of Aeronautics, Washington 25, D.C.
Chief, Bureau of Ordnance, Washington 25, D.C.
Chief, Bureau of Ships, Washington 25, D.C.
Chief, Bureau of Yards and Docks, Washington 25, D.C.
The Quartermaster General, Headquarters, U.S. Marine Corps, Washington 25, D. C.
Officer in Charge, Navy Purchasing Office, Main Navy Building, 17th Street and Constitution Avenue, Washington 25, D.C.
Officer in Charge, Navy Purchasing Office, 111 East 16th Street, New York, N.Y.
General Stores Supply Officer, General Stores Supply Office, 700 Robbins Avenue, Philadelphia 11, Pa.
Electronics Supply Officer, Electronic Supply Office, Great Lakes, Ill.
Aviation Supply Officer, Aviation Supply Office, 700 Robbins Avenue, Philadelphia 11, Pa.
Officer in Charge, Ship Parts Control Center, Naval Supply Depot, Mechanicsburg, Pa.
Yards and Docks Supply Officer, Yards and Docks Supply Office, Naval Construction Center, Port Hueneme, Calif.
Submarine Supply Officer, Submarine Supply Office, Rittenhouse Square Building, 19th and Walnut Streets, Philadelphia 3, Pa.
Commander, Naval Shipyard, Building 153, Portsmouth, N.H.
Supply Officer, Naval Gun Factory, Building 176, M Street at 8th Street Southeast, Washington 25, D.C.
Fuel Supply Officer, Fuel Supply Office, Naval Gun Factory, Washington 25, D.C.
Ordnance Supply Officer, Naval Ordnance Supply Office, Mechanicsburg, Pa.
Chief of Naval Research, Washington 25, D.C.
Director, Special Devices Center, Office of Naval Research, Sands Point, Port Washington, Long Island, N.Y.
Commander, Military Sea Transportation Service, Washington 25, D.C.
Office in Charge, Navy Ships Store Office, 29th Street and 3rd Avenue, Brooklyn 32, N.Y.

Activities listed below purchase general-use items as well as items of a technical nature to fulfill their own special requirements or those of other naval activities in their geographical area for which they purchase.

Navy Purchasing Offices, Los Angeles, Calif.; San Francisco, Calif.; Norfolk, Va.
Naval Supply Depots, Newport, R.I.; Great Lakes, Ill.; Seattle, Wash.
Naval Shipyards, Boston, Mass.; Philadelphia, Pa.; Charleston, S.C.; Bremerton, Wash.
Naval Air Stations, Patuxent River, Md.; Jacksonville, Fla.; Pensacola, Fla.; Memphis, Tenn.; Corpus Christi, Tex.; Dallas, Tex.
Marine Corps Air Station, Miami, Fla.
Naval Ordnance Plants, Indianapolis, Ind.; Forest Park, Ill.; York, Pa.; Macon, Ga.
Naval Ammunition Depots, Crane, Ind.; McAlester, Okla.
Naval Stations, New Orleans, La.; Orange, Tex.
Naval Academy, Annapolis, Md.
Naval Submarine Base, New London, Conn.; Naval Air Material Center, Naval Base, Philadelphia, Pa.; Naval Proving Grounds, Dahlgren, Va.; Navy Mine Countermeasures Station, Panama, City, Fla.; Naval Research Laboratory, Anacostia, Washington 25, D.C.; Navy Hydrographic Office, Suitland, Md.; Naval Ordnance Laboratory, White Oak, Md.; Naval Powder Factory, Indianhead, Md.
Marine Corps Depot of Supplies, Philadelphia, Pa.; San Francisco, Calif.

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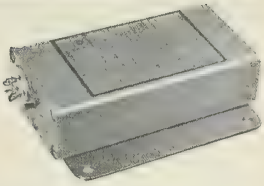

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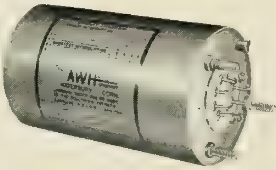

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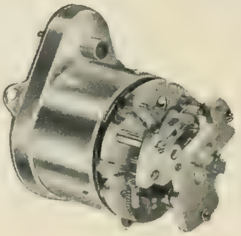

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Write for Bulletin AWH MO 800, -801, -802, -804.

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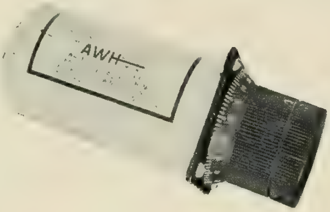

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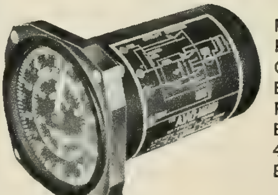

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AWH-RC-300	Precision Interval Timers
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AWH-TD-403	Basic Time Delay Relays
AWH-TD-404-405	Dial Adjustable Time Delay Relays
AWH-TD-406	Basic Hermetic Time Delay Relays
AWH-ET-600-601	Elapsed Time Indicators
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BUREAU OF YARDS AND DOCKS, Dept. of Navy, Washington 25, D. C.
Procurement Items: Cranes, derricks, hoists.

OFFICER IN CHARGE, NAVY PURCHASING OFFICE, Main Navy Bldg., 17th and Constitution Ave., Washington 25, D. C.

Procurement Items: Floor sanders, polishers and vacuum cleaners; electric motors; generators and generators sets; files, rasps, saws, blades and frames, edge tools, mechanical measuring tools; chests, kits and sets of a variety of types of tools; industrial cutlery; fastening devices; industrial X-ray machines; portable conveyor units; trucks, trailers, tractors, stackers and accessories; push carts, handcarts, wheelbarrows; industrial batteries; pallets and pallet trucks; calipers, tapes, squares, straight edges, vernier, gages, levels, pumb rules, protractors; metal rules, scales; sets, kits and outfits of measuring tools; bending and forming machines; power-driven presses; punches and shearing machines; forging machines and hammers; wire and metal ribbon forming machines; drawing machines; metal finishing equip.

AVIATION SUPPLY OFFICER, Naval Aviation Supply Office, 700 Robbins Ave., Philadelphia 11, Pa.
Procurement Items: Propellers; propeller hub barrels, aircraft rotor blades, rotor hubs, spinners, propeller synchronizers; landing shock struts; aircraft wheel and brake systems, landing floats, landing skis, auxiliary fuel tanks, hydraulic accumulators, lifting bags, actuating cylinders; hydraulic pumps, aircraft pressurizing and breathing equip.; cargo and personnel parachutes; parachute canopies; aerial delivery containers; aerial delivery slings; aircraft cargo tiedown equipment; safety belts and shoulder harnesses; cabin and cockpit heaters; tow target releases; aircraft windshield wipers; deceleration parachutes; tow bars; fin tilt jacks; landing gear lock assemblies; books and pamphlets; radio communication equip.; sound and recording equip.; radar equip.; headsets, microphones and speakers; electric hardware and supplies; electric motors; electric control equipment; electric generator and generator sets; dry cell batteries; electric wire and cable; power-driven presses; punches and shearing machines; forging machines and hammers; wire and metal ribbon forming machines; drawing mechines; metal finishing equipment; aircraft air-conditioning equip.; tires and tubes.

SUPPLY OFFICER, NAVAL GUN FACTORY, Building 176, M Street at 8th S.E., Washington 25, D. C.
Procurement Items: Electric generators and generator sets.

U.S. MARINE CORPS

QUARTERMASTER GENERAL, Headquarters, U.S. Marine Corps, Washington 25, D. C.
Procurement Items: Unmounted antifriction bearings; unmounted plain bearings; books and pamphlets; acetylene; carbon dioxide; floor sanders, polishers, vacuum cleaners; brooms, brushes, mops and sponges; cleaning and polishing compounds; circuit breakers; switches; electric connectors; lugs, terminals and terminal strips; coils and transformers; electronic tubes, transformers and rectifying crystals; antennae, waveguides and related equipment; relays, contractors and solenoids; electric motors; electric control equip.; dry cell batteries; electric wire and cable; extinguishers, axes, rakes, brooms; bolts, studs, screws; nuts and washers; nails, keys and pins; discs, wheels, stones, abrasives; lubrication and fuel dispensing equip.; pushcarts and wheelbarrows; bending and forming machines; power-driven presses; punches and shearing machines; forging machines and hammers; wire and metal ribbon forming machines; drawing machines; metal finishing equip.; welding, flame cutting and metalizing equip.

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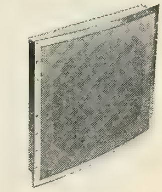
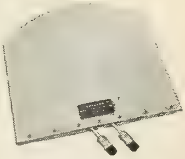


DM C-1 Flush mounted UHF Annular Slot Antenna. →
V.S.W.R.—2.4:1 from 225 to 400 mc
Contour—from flat to 30" radius
Weight—Maximum 15 pounds



DM CNI-1 Duplex UHF L-band Tail Fin Antenna. →
V.S.W.R.—2:1 for both UHF and L-band antenna
Mounting—within dielectric tail fin cap
Weight — 4.31 pounds . . . separate input connectors eliminate external diplexing filters.

DM C7-2 High Speed UHF Blade Antenna. →
V.S.W.R.—2.5:1 from 225 to 400 mc
Mounting—duplicates AT-256/ARC Antenna
Drag—3 pounds for DM C7-2 versus 17.5 pounds for AT-256 at Mach 0.9 and 25,000 feet altitude.
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U. S. MISSILE ARSENAL

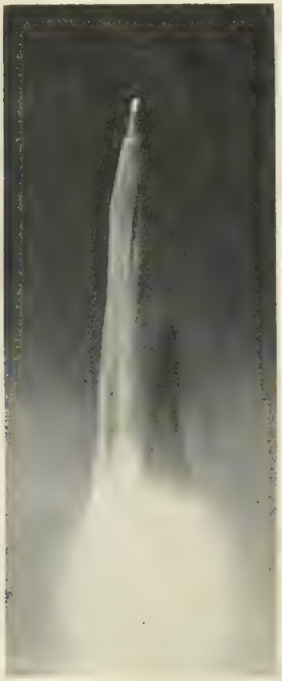
Over the past ten years, the missile has matured from a low-cost research program to a $3.5-billion market. On the following pages is a directory of the missiles that stock the U.S. arsenal.

ATLAS (SM-65)

TYPE: Surface-to-Surface
SERVICE: Air Force
STATUS: Developmental

PRIME CONTRACTOR

Convair
San Diego, Calif.



Atlas

BOMARC (IM-99)

TYPE: Surface-to-Air
SERVICE: Air Force
STATUS: In Production

PRIME CONTRACTOR

Boeing Airplane Co.
Seattle, Wash.

PRINCIPAL SUBCONTRACTORS

Booster rocket
Aerojet-General Corp.
Azusa, Calif.
Ramjet engines
Marquardt Aircraft Co.
Van Nuys, Calif.
Homing radar, flight control group
Westinghouse Electric Corp.
Baltimore, Md.

BULL GOOSE (SM-73)

TYPE: Diversionary Missile
SERVICE: Air Force
STATUS: Developmental

PRIME CONTRACTOR

Fairchild Engine & Airplane Corp.
Fairchild Aircraft Div.
Hagerstown, Md.

ASSOCIATE CONTRACTOR

Component: Electronic
Ramo-Wooldridge Corp.
Los Angeles, Calif.

BULLPUP

TYPE: Air-to-Surface
SERVICE: Navy
STATUS: Developmental

PRIME CONTRACTOR

The Martin Co.
Middle River, Md. & Orlando, Fla.

PRINCIPAL SUBCONTRACTORS

Propulsion
Aerojet-General Corp.
Azusa, Calif.
Fuze
Naval Ordnance Lab.
Corona, Calif.
Fuze
Elgin National Watch Co.
Elgin, Ill.

Bullpup

CORPORAL

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Operational

PRIME CONTRACTORS

Firestone Tire & Rubber Co.
Los Angeles, Calif.
and
Gilfillan Brothers
Los Angeles, Calif.

PRINCIPAL SUBCONTRACTORS

Gyro, Controls
Gary Multiplier Co.
San Gabriel, Calif.
Motor
Ryan Aeronautical Co.
San Diego, Calif.

CORVUS

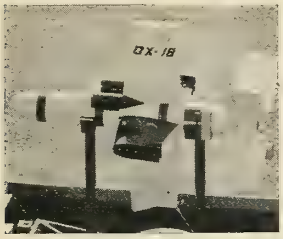
TYPE: Air-to-Surface
SERVICE: Navy
STATUS: Developmental

PRIME CONTRACTOR

Temco Aircraft Corp.
Dallas, Texas

PRINCIPAL SUBCONTRACTORS

Propulsion
Reaction Motors, Inc.
Danville, N. J.
Guidance
Texas Instrument Co.
Dallas, Texas
Guidance
W. L. Maxson Corp.
New York, New York



Dart

DART

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Operational

PRIME CONTRACTOR

Aerophysics Development Corp.
Santa Monica, Calif.

PRINCIPAL SUBCONTRACTORS

Utica Bend Corp.
Utica, Michigan
Rocket motor, propellant manufacture and loading
Grand Central Rocket Co.
Redlands, Calif.
Fuze
Bulova Research & Development Lab.
Flushing 70, N. Y.
Gyroscope
Whittaker Gyroscope Co.
Van Nuys, Calif.

FALCON (GAR 1D, 2A)

TYPE: Air-to-Air
SERVICE: Air Force
STATUS: Operational

PRIME CONTRACTOR

Hughes Aircraft Co.
Culver City, Calif.

PRINCIPAL SUBCONTRACTORS

Rocket motor
Thiokol Corp.
Redstone Arsenal, Ala.
Battery
Willard Storage Battery Co.
Cleveland, Ohio
Stabilizer, missile container, flipper
AVCO Mfg. Corp.
Richmond, Ind.
Frequency converter
Vectron, Inc.
Waltham, Mass.
Fuze, fuze arming
General Sintering Corp.
Melrose Park, Ill.

GREEN QUAIL (GAM-72)

TYPE: Diversionary Missile
SERVICE: Air Force
STATUS: Developmental

PRIME CONTRACTOR

McDonnell Aircraft Corp.
St. Louis, Mo.

PRINCIPAL SUBCONTRACTOR

Aircraft modification
Boeing Aircraft Co.
Seattle, Wash.

HAWK I

TYPE: Surface-to-Air
SERVICE: Army
STATUS: Operational

PRIME CONTRACTOR

Raytheon Mfg. Co.
Missile & Radar Div.
Bedford, Mass.

PRINCIPAL SUBCONTRACTORS

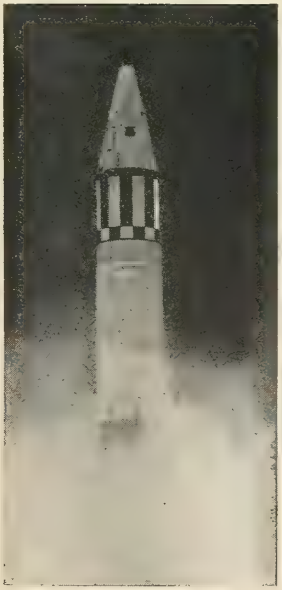
Motor (single chamber)
Aerojet-General Corp.
Sacramento, Calif.
Airframe and launcher
Northrop Aircraft Corp.
Hawthorne, Calif.
Warhead and allied accessories
Picatinny Arsenal
Dover, N. J.
Loader
Food Machinery & Chemical Corp.
Ordnance Div.
San Jose, Calif.

HONEST JOHN

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Operational

PRIME CONTRACTORS

Douglas Aircraft Co.
Santa Monica, Calif.
and
Emerson Electric Co.
St. Louis, Mo.



Jupiter

JUPITER

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Developmental

PRIME CONTRACTOR

Chrysler Corp.
Detroit, Mich.

PRINCIPAL SUBCONTRACTORS

Rocket motor and associated equipment
North American Aviation, Inc.
Los Angeles, Calif.
All-inertial guidance package
Ford Instrument Co.
Long Island, N. Y.

LACROSSE

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Operational

PRIME CONTRACTOR

Cornell Aeronautical Lab.
Buffalo, N. Y.

PRINCIPAL SUBCONTRACTORS

R&D co-contractor, system production
The Martin Co.
Baltimore 3, Md.
Motor Development
Thiokol Chemical Corp.
Huntsville, Ala.

LaCrosse

LITTLE JOHN

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Operational

PRIME CONTRACTOR

Emerson Electric Co.
St. Louis, Mo.

MACE (TH-76)

TYPE: Surface-to-Surface
SERVICE: Air Force
STATUS: Flight Testing

PRIME CONTRACTOR

The Martin Co.
Baltimore 3, Md.

PRINCIPAL SUBCONTRACTORS

Guidance
Goodyear Aircraft Co.
Akron 15, Ohio
Inertial Guidance
A. C. Spark Plug
Milwaukee, Wis.

MATADOR (TM61 & 61C)

TYPE: Surface-to-Surface
SERVICE: Air Force
STATUS: Operational

PRIME CONTRACTOR

The Martin Co.
Baltimore 3, Md.

NIKE-AJAX

TYPE: Surface-to-Air
SERVICE: Army
STATUS: Operational

PRIME CONTRACTOR

Western Electric Co.
New York 5, N. Y.

PRINCIPAL SUBCONTRACTORS

Missile
Douglas Aircraft Co.
Charlotte, N. C.

NIKE-HERCULES

TYPE: Surface-to-Air
SERVICE: Army
STATUS: Final Testing

PRIME CONTRACTORS

Western Electric Co., Inc.
New York 5, N. Y.
Missile (exclusive of guidance section), launching area equipment, assembly area equipment
Douglas Aircraft Co.
Charlotte, N. C.

PRINCIPAL SUBCONTRACTORS

Launchers
Consolidated Western Steel
Los Angeles, Calif.
Boosters
Goodyear Aircraft Co.
Akron, Ohio
Metal parts for boosters
Borg-Warner
Ingersall Div.
Kalamazoo, Mich.

NIKE-ZEUS

TYPE: Surface-to-Air
SERVICE: Army
STATUS: Developmental

Nike Ajax

PRIME CONTRACTOR

Western Electric Co.
New York 5, N. Y.

PRINCIPAL SUBCONTRACTORS

Missile; launching and handling equipment
Douglas Aircraft Co.
Santa Monica, Calif.
Propellant
Grand Central Rocket Co.
Redlands, Calif.

PERSHING

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Developmental

PRIME CONTRACTOR

Army Ballistic Missile Agency
Redstone Arsenal
Huntsville, Ala.

POLARIS

TYPE: Surface-to-Surface
SERVICE: Navy
STATUS: Developmental

MAJOR CONTRACTOR

Lockheed Aircraft Co.
Sunnyvale, Calif.

PRINCIPAL SUBCONTRACTORS

Propulsion
Aerojet-General Corp.
Sacramento, Calif.
Guidance Development
Massachusetts Institute of Technology
Cambridge, Mass.
Instrumentation
Interstate Electronic Corp.
Anaheim, Calif.
Launcher Design
Westinghouse Corp.
Sunnyvale, Calif.

PETREL

TYPE: Air-to-Surface
SERVICE: Navy
STATUS: Operational

PRIME CONTRACTOR

Fairchild Engine & Airplane Co.
Guided Missile Div.
Wyandanch, L. I.

PRINCIPAL SUBCONTRACTORS

Airframe, propulsion, guidance, fire control equipment
Fairchild Engine & Airplane Co.,
Guided Missile Div.
Wyandanch, L. I.
Fuze
Naval Ordnance Lab.
White Oak, Md.
Launcher
Lockheed Aircraft Corp.
Burbank, Calif.
Warhead
Naval Ordnance Plant
Forest Park, Ill.
Fuze
Bellock Corp.
New York, N. Y.

RASCAL (GM-63)

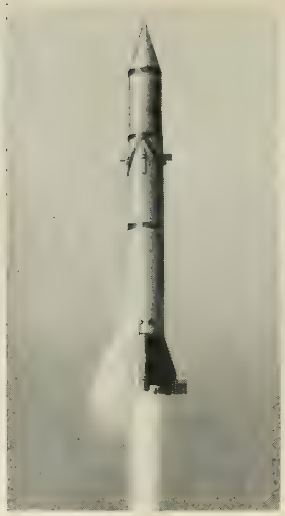
TYPE: Air-to-Surface
SERVICE: Air Force
STATUS: Operational

PRIME CONTRACTOR

Bell Aircraft Corp.
Niagara Falls, N. Y.

PRINCIPAL SUBCONTRACTORS

Guidance components
Radio Corp. of America
Camden, N. J.



Redstone

Guidance components
Texas Instrument Co.
Dallas, Texas
Guidance components
Arma Corp.
New York, N. Y.

REDSTONE

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Operational

PRIME CONTRACTOR

Chrysler Corp.
Detroit, Mich.

PRINCIPAL SUBCONTRACTORS

Rocket motor & associated equipment
North American Aviation, Inc.
Los Angeles, Calif.
Missile fuselage
Reynolds Metal Co.
Louisville, Ky.

REGULUS I

TYPE: Surface-to-Surface
SERVICE: Navy
STATUS: Operational

PRIME CONTRACTOR

Chance Vought Aircraft, Inc.
Dallas, Texas

PRINCIPAL SUBCONTRACTORS

Airframe, guidance
Chance Vought Aircraft, Inc.
Dallas, Texas
Propulsion
Allison Division
General Motors Corp.
Indianapolis, Ind.
Warhead, fuze
Sandia Corp.
Albuquerque, N. M.

REGULUS II

TYPE: Surface-to-Surface
SERVICE: Navy
STATUS: In Production

PRIME CONTRACTOR

Chance Vought Aircraft, Inc.
Dallas, Tex.

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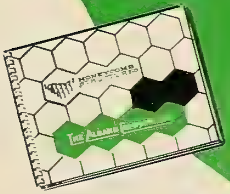

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Regulus II (Cont'd)

PRINCIPAL SUBCONTRACTORS

Airframe
Chance Vought Aircraft, Inc.
Dallas, Tex.
Propulsion
General Electric Co.
Aircraft Gas Turbine Div.
Cincinnati, Ohio
Guidance
A. C. Spark Plug
Division of Guided Missiles
Milwaukee, Wis.
Warhead, fuze
Sandia Corp.
Albuquerque, N. M.
Computer
Texas Instrument Co.
Dallas, Tex.

SERGEANT

TYPE: Surface-to-Surface
SERVICE: Army
STATUS: Developmental

PRIME CONTRACTORS

System
Jet Propulsion Lab.
Pasadena, Calif.
All critical R&D components
Sperry Gyroscope Co.
Salt Lake City, Utah

PRINCIPAL SUBCONTRACTOR

Motor
Thiokol Chemical Corp.
Huntsville, Ala.

Sergeant

SIDEWINDER

TYPE: Air-to-Air
SERVICE: Navy
STATUS: Operational

PRIME CONTRACTORS

Philco Corp.
Philadelphia, Pa.

General Electric Co.
Utica, N. Y.

PRINCIPAL SUBCONTRACTORS

Propulsion metal parts
Norris-Thermodor
Los Angeles, Calif.

Hunter Douglas
Riverside, Calif.

SNARK (SM-62)

TYPE: Surface-to-Surface
SERVICE: Air Force
STATUS: Operational

PRIME CONTRACTOR

Northrop Aircraft, Inc.
Hawthorne, Calif.

SPARROW I

TYPE: Air-to-Air
SERVICE: Navy
STATUS: Operational

PRIME CONTRACTOR

Sperry Gyroscope Co.
Great Neck, L. I., N. Y. and Bristol, Tenn.

PRINCIPAL SUBCONTRACTORS

Airframe
Douglas Aircraft Co., Inc.
Santa Monica, Calif.
Propulsion
Aerojet-General Corp.
Azusa, Calif.
Guidance
Sperry Gyroscope Co.
Great Neck, L. I., N. Y.

SPARROW II

TYPE: Air-to-Air
SERVICE: Navy
STATUS: Experimental

PRIME CONTRACTOR

Douglas Aircraft Co.
Santa Monica, Calif.

PRINCIPAL SUBCONTRACTORS

Airframe
Douglas Aircraft Co.
Santa Monica, Calif.
Propulsion
Aerojet-General Corp.
Azusa, Calif.
Guidance
Bendix Aviation Corp.
Burbank, Calif.
Fuze-Warhead
Naval Ordnance Lab.
Corona, Calif.
Fuze
Bendix Aviation Corp.
Detroit, Mich.
Safety and Arming
Elgin National Watch Co.
Burbank, Calif.

SPARROW III

TYPE: Air-to-Air
SERVICE: Navy
STATUS: Developmental

PRIME CONTRACTOR

Raytheon Mfg. Co.
Bedford, Mass.

PRINCIPAL SUBCONTRACTORS

Airframe, guidance, fuze
Raytheon Mfg. Co.
Bedford, Mass.
Propulsion
Aerojet-General Corp.
Azusa, Calif.
Warhead
Naval Ordnance Lab.
White Oak, Md.
Warhead
Rheem Mfg. Co.
Downey, Calif.
Safety and Arming
Elgin National Watch Co.
Burbank, Calif.

TALOS

TYPE: Surface-to-Air
SERVICE: Navy
STATUS: Operational

PRIME CONTRACTORS

Shipborne
Bendix Aviation Corp.
Bendix Products Div.
Mishawaka, Ind.
Land-based
Radio Corp. of America
Camden, N. J.

Talos

TARTAR

TYPE: Surface-to-Air
SERVICE: Navy
STATUS: Developmental

PRIME CONTRACTOR

Convair
Pomona, Calif.

PRINCIPAL SUBCONTRACTOR

Power tubes
Varian Associates
Palo Alto, Calif.

TERRIER

TYPE: Surface-to-Air
SERVICE: Navy
STATUS: Operational

PRIME CONTRACTOR

Convair
Pomona, Calif.

THOR (SM-75)

TYPE: Surface-to-Surface
SERVICE: Air Force
STATUS: Developmental

PRIME CONTRACTOR

Douglas Aircraft Co.
Santa Monica, Calif.

PRINCIPAL SUBCONTRACTOR

System
Ramo-Wooldridge Corp.
Santa Monica, Calif.

TITAN (SM-68)

TYPE: Surface-to-Surface
SERVICE: Air Force
STATUS: Developmental

PRIME CONTRACTOR

The Martin Co.
Denver, Colo.

PRINCIPAL SUBCONTRACTOR

System
Ramo-Wooldridge Corp.
Los Angeles, Calif.

MISSILE
PURCHASING
DIRECTORY

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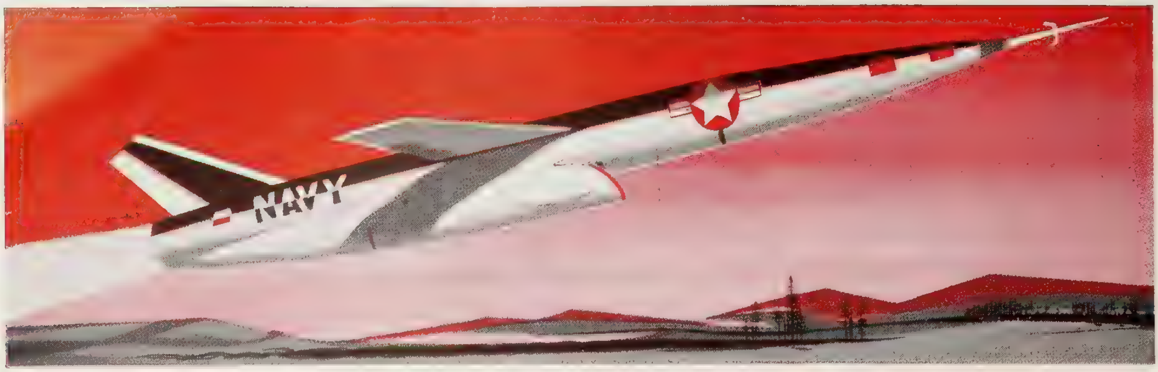

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MISSILE PURCHASING DIRECTORY

Below are listed over 3,000 companies engaged in the missile business, along with their address, phone number, and key purchasing and sales personnel. Information concerning type of company activity may be determined by the coding at the end of each listing. Codings are explained in the lower right hand corner of every other page. The editors have made every effort to obtain listings for *all* companies active in the missile industry, but recognize that with a first issue some companies will be omitted. To the best of our abilities, *at least* two inquiries were sent to all missile and missile parts manufacturers. Companies not listed but interested in being listed in future issues should write to: Editor, MISSILE MARKET GUIDE & DIRECTORY EDITION, American Aviation Publications, 1001 Vermont Ave., N. W., Washington, D. C.

★AC SPARK PLUG DIV., GENERAL MOTORS CORP.
1925 E. Kenilworth Pl., Milwaukee 1, Wis. (Tel. BR 3-1120)
Purch. Dir.: Jack Briner
Sales & Adv. Mgr.: M. B. Price
PS, GS, GE, TS
★(See advertisement in this issue)

ACF INDUSTRIES, INC., ADVANCED PRODUCTS DIV.
St. Charles, Mo. (Tel. RAndolph 4-2980)
Purch. Mgr.: P. M. Tintera
Contr. Mgr.: J. H. Vaughan
MF, WN, PS, GS, GH, GE, TS, TR

AEMCO INC.
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Purch. Agent: A. P. Pitzl
Asst. Purch. Agent: D. W. Wrucke
Mgr.-Sales: J. F. Krost GE, CO, TR

AMP INC.
Eisenhower Blvd., Harrisburg, Pa. (Tel. CEdar 4-0101)
Purch. Agent: George A. Beck
V. P.-Sales: G. E. Walker
MF, GS, GH, GE, TS, TR

A&P METAL PRODUCTS MFG. CORP.
111 Bloomingdale Rd., Hicksville, L. I., N. Y. (Tel. WElls 1-1575)
Purch. Agent: L. J. Wepy
MF, WN, PS, GS, GH

A. P. W. CO.
72 W. Main St., Rockaway, N. J. (Tel. 9-0643)
Purch. & Sales: Arthur Pfeil GE, TS

ABALON PRECISION MFG. CORP.
540 Casanova St., New York 59, N. Y. (Tel. LUdlow 9-5682)
Purch. Agent: Lon Orent
MF, WN, PS, GS, GH

ABBOTT SCREW & MFG. CO.
1728 W. Walnut St., Chicago 12, Ill. (Tel. CHesapeake 3-3500)
MF, WN, PS, GH

ABRAMS INSTRUMENT CORP.
606 E. Shiawassee St., Lansing 1, Mich. (Tel. IVanhoe 4-9441)
Purch. Agent: C. E. Adams
Asst. Purch. Agent: F. Conner
V. P.-Sales: C. J. Arksey
PS, GS, GH, GE, CO, TS, TR

ACCESSORY CONTROLS & EQUIPMENT CORP.
146 Willard Ave., Newington, Conn. (Tel. ADams 2-7020)
Purch. Agent: C. A. Putini
V. P.-Engrg.-Sales: John J. Kardys
MF, WN, PS, GS, GH, TS

ACCESSORY PRODUCTS CO., DIV.-TEXTRON INC.
616 W. Whittier Blvd., Whittier, Calif. (Tel. OXbow 3-3747)
Sales Purch. Agent: Jerry Hudson
PS, GS

ACCURATE ELECTRONICS CORP., Dept. D
169 S. Abbe Rd., Elyria, O. (Tel. EMerson 6-7925)
MF, WN, PS, GS, GH, GE, CO, TS, TR

ACCURATE INSULATED WIRE CORP.
25 Fox St., New Haven 1, Conn. (Tel. STate 7-2194)
Sales Mgr.: John V. Robinson
MF, PS, GS, TS, TR

ACCURATE SPECIALTIES CO. INC.
37-11 57th St., Woodside, N. Y. (Tel. TWining 9-5757)
Purch. Agent: Lawrence Diamond
Asst. Purch. Agent: Bernard Triffleman
Buyer: Robert MacIsaac
Sales Mgr.: Nathan Zimmes
MF, WN, PS, GE, TS, TR

ACE COIL & ELECTRONICS CO.
917 Lincoln Hwy., Metuchen, N. J. (Tel. LIberty 8-3580)
Purch. Agent: A. D. Meyer
Buyer: I. M. MacDonald
Sales Mgr.: Fred Sampson
GE, CO, TS, TR

ACE DRILL BUSHING CO. INC.
5407 Fountain Ave., Los Angeles 29, Calif. (Tel. HO 9-8253)
V. P.-Mfg.: George Clement
V. P.-Sales: George T. Smith PS

ACE ELECTRONICS ASSOCIATES, INC.
99 Dover St., Somerville 44, Mass. (Tel. SOmerset 6-5130)
Purch. Agent: J. Kopelman
Sales Mgr.: Paul Golstein GE, TS, TR

ACE SPRING MFG. CO., INC.
78 W. Houston St., New York, N. Y. (Tel. ALgonquin 4-4267)
MF, PS, TS, TR

ACHESON COLLOIDS CO., DIV.-ACHESON INDUSTRIES, INC.
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MF, GE, CO, TS, TR

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MF, PS, GS, TR

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716 Wyoming St., San Antonio 3, Texas (Tel. CApitol 7-4601)
Gen. Mgr.: Steve Margozewitz
Sales: Mrs. Agnes M. Mahula

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14 Water St., Cuba, N. Y. (Tel. Cuba 4)
Dir.-Purch.: A. J. Rudy
Dir.-Sales: J. D. Hall
GS, GH, GE, TS, TR

ACME ELECTRIC HEATING CO.
1217 Washington St., Boston 18, Mass. (Tel. HAncock 6-1569)
Pres.: S. Lincoln Price
PS, GS, GH, TR

ACME GEAR CO., INC.
129 Coolidge Ave., Englewood, N. J. (Tel. LO 8-2245)
Gen. Mgr.: Russell Wolff
Sales Mgr.: Harry L. Stringfield
PS, GS

ACME INDUSTRIAL CO.
200-222 N. Laflin St., Chicago 7, Ill. (Tel. MOnroe 6-4122)
Purch. Agent: Herbert N. Straus
V. P.-Sales Mgr.: Warner T. Bracken
MF, PS, GS, GE, CO, TS

ACME MFG. & GASKET CO.
738-40 N. 41st St., Philadelphia 4, Pa. (Tel. EVergreen 6-8622)
Gen. Mgr.: Harry E. Wagenseller
MF, PS

ACME WELDING DIV., THE UNITED TOOL & DIE CO.
1031 New Britain Ave., West Hartford 10, Conn. (Tel. CHapel 6-6531)
MF, PS, GS

ACORN TOOL & MFG., INC.
York & John Sts., Cincinnati 14, Ohio (Tel. CHerry 1-2330)
V. P.: Ed Stern
Sales: Ed Krabacher MF, WN, PS

ACOUSTICA ASSOCIATES, INC.
26 Windsor Ave., Mineola, N. Y. (Tel. PIoneer 7-7900)
Purch. Agent: Arthur Baumach
V. P.-Sales: Ralph Reynolds
PS, GS, GH, GE, CO, TS, TR

ACRO PRODUCTS CO.
369 Shurs Lane, Philadelphia, Pa. (Tel. Ivy Ridge 3-5969)
Purch. Agent: M. Hanlon
Sales Mgr.: Jack Snyderman

ACROMAG INC.
22519 Telegraph Rd., Detroit 41, Mich. (Tel. ELgin 6-7211)
Business Mgr.: R. P. Hennings
V. P.-Sales: T. P. Jones
PS, GS, GE, CO, TS, TR

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

ACROMARK CO., THE
445 Morrell St., Elizabeth 4, N. J. (Tel. ELizabeth 2-6500)
Purch. Agent: M. A. Palmiere
Sales Mgr.: Wm. A. Heine, Jr.
MF, WN, PS, GS, GE, CO, TS, TR

ACTON LABORATORIES INC.
533 Main St., Acton, Mass. (Tel. COlonial 3-7756)
Prod. Mgr.: Richard Hall
Sales Mgr.: Leroy C. Bower, Jr.
GE, CO, TS, TR

ACTUATION RESEARCH CORP.
416 N. Glendale Ave., Glendale 6, Calif. (Tel. CHapman 5-6855)
Purch. Coordinator: E. H. Mitchell
Expediter: B. Mueller
WN, PS, GS, GE, TS

ADAM METAL SUPPLY INC.
48th Ave. & East River, Long Island City 1, N. Y. (Tel. STillwell 6-7737)
V. P.-Purch.: Julius Brody
Sales: Marvin Marin **MF**

ADAMS RITE MFG. CO.
540 W. Chevy Chase Dr., Glendale 4, Calif. (Tel. CHapman 5-1096)
Dir.-Purch.: J. Rocca
Buyer: J. Donahue
Dir.-Dev. & Chief Sales Engr.: Donnell Grizzard **MF, PS, GS**

ADLER ELECTRONICS, INC.
1 Le Fevre Lane, New Rochelle, N. Y. (Tel. NE 6-1620)
Dir.-Purch.: Alan Brown
V. P.-Mfg.-Sales: Alfred Strogoff
V. P.: Harry Adler
Buyer: Fred Meyers
GS, GE, CO, TS, TR

★ADVANCE GEAR & MACHINE CORP.
5851 Holmes Ave., Los Angeles 1, Calif. (Tel. LUdlow 7-8103)
Purch. Agent: Stan Jackson
Sales Mgr.: Raymond L. Seitz
PS, GE, TS, TR
★(See advertisement in this issue)

ADVANCE INDUSTRIES, INC.
640 Memorial Dr., Cambridge, Mass. (Tel. UNiversity 4-6800)
Dir.-Contracts & Proc.: A. J. Van Pelt
Purch. Agent: William L. Kelly
Purch. Dept. Mech. Sec. Head: O. S. Lightbody
Purch. Dept. Electrical Sec. Head: S. J. Pantano
Asst. to Pres.-Sales: Col. R. L. Johnston
PS, GS, GE, CO, TS, TR

ADVANCE RELAYS, ELECTRONICS DIV., ELGIN NATIONAL WATCH CO.
366 Bluff City Blvd., Elgin, Ill. (Tel. SHerwood 2-5700)
Purch. Agent: E. G. Nelson
Gen. Sales Mgr.: W. R. Entrikin

ADVANCED ELECTRONICS, INC.
94 Silas Deane Hwy., Rocky Hill, Conn. (Tel. JAckson 9-6881)
Purch.: Alfred Dinunzio
Sales: Sam Friedman
MF, PS, GS, GH, GE, CO, TS

ADVANCED PRODUCTS CO., THE
59 Broadway, North Haven, Conn. (Tel. CEdar 9-1664)
Treas.: Arthur Hostage
MF, WN, PS, GS, GH, GE, CO, TS, TR

AERO ELECTRONICS CORP.
1657 W. 134th St., Gardena, Calif. (Tel. FAculty 1-2196)
Gen. Mgr.: Stephen E. Taylor
Chief Engr.: James X. Green
Prod. Mgr.: Richard L. Coles **TR**

AERO INSTRUMENT CO.
5105 Denison Ave., Cleveland 2, O. (Tel. WOodbine 1-5574)
Gen. Mgr.: Emil Daiber
Engrg. & Sales: F. U. Hill **GE**

AERO LEATHER PRODUCTS CO.
1740 W. 59th St., Los Angeles 47, Calif. (Tel. PLeasant 3-1461)
V. P.-Purch.: C. E. Seymour
Gen. Sales Mgr.: W. E. Seymour
MF, PS, GE, TR

AERO RESEARCH INSTRUMENT CO. INC.
315 N. Aberdeen St., Chicago 7, Ill. (Tel. TAylor 9-6400)
Purch. Agent: E. W. Ostrom
Gen. Mgr.-Sales: B. Verson
MF, PS, GS, GE, CO, TS

AERO SUPPLY MFG. CO., INC.
611 W. Main St., Corry, Pa. (Tel. 2-8261)
Purch. Agent: P. E. Dwyer
Buyer: Dean Houser
V. P.-Sales & Engrg.: E. F. Pain
MF, WN, PS, GS, GH, GE, CO, TS

AERODEX, INC.
P. O. Box 123 (Airport Br.), Miami 48, Fla. (Tel. TUxedo 8-3411)
Purch. Agent: A. Van Wagner
Buyers: R. Huffman, R. LaPerche, A. Sakala
Sales & Serv. Mgr.: Hermann Waker, Jr.
MF, WN, PS, GS, GH, GE

AEROFLEX CORP., THE, AEROFLEX LABS. DIV.
34-06 Skillman St., Long Island City 1, N. Y. (Tel. STillwell 4-7000)
V. P.-Sales: R. G. Sanders
MF, GS, GE, TS, TR

AEROJET-GENERAL CORP.
6352 N. Irwindale Ave., Azusa, Calif. (Tel. CUmberland 3-6111)
Dir.-Materiel: W. R. Rozance
Gen. Purch. Agent: T. E. Johnston

AEROLITE ELECTRONICS CORP.
2207 Summit Ave., Union City, N. J. (Tel. UNion 3-2955)
Purch. Agent: V. G. Matto
MF, WN, PS, GS, GH, GE, CO, TS, TR

AERONAUTICAL ELECTRONICS, INC.
Raleigh-Durham Airport, P. O. Box 6527, Raleigh, N. C. (Tel. TEmple 4-6209)
Purch. Agent: Donald C. Hicks, Jr.
GH, TR

AERONAUTICAL & INSTRUMENT DIV., ROBERTSHAW-FULTON CONTROLS CO.
Santa Ana Freeway at Euclid Ave., Anaheim, Calif. (Tel. KEystone 5-8151)
Purch. Agent: L. L. Moloney
Asst. Purch. Agent: W. Houseworth
Buyer-Outside Prod.: R. Holkestad
Buyers: W. Hamilton & J. Krause
Mgr.-Field Engrg. & Sales: R. H. Heller
MF, PS, GS, GH, GE, CO, TS, TR

AERONCA MFG. CORP.
1712 Germantown Rd., Middletown, O. (Tel. GArden 2-2751)
Dir.-Purch.: R. M. Paul
Purch. Sec.: L. Kahny
Material Negotiation Sec.: T. Brunjes
Material Control & Outside Mfg. Secs.: R. W. Clark
Dir.-Fld. Serv. Dept.: H. C. Pettit
Research—Baltimore 28, Md. (Tel. RIdgeway 7-0200) **MF, TS, TR**

AERONUTRONIC SYSTEMS, INC., SUB-FORD MOTOR CO.
1234 Air Way, Glendale, Calif. (Tel. CH 5-6651)
Dir.-Missile Technology: Dr. Joseph V. Charyk
Dir.-Purch.: C. D. Graef

AEROPHYSICS DEVELOPMENT CORP., SUB.-CURTISS-WRIGHT CORP.
P. O. Box 689, Santa Barbara, Calif. (Tel. WOodland 2-9135)
Pres.: Dr. William Bollay

AEROPRODUCTS OPERATIONS, ALLISON DIV., GENERAL MOTORS CORP.
Municipal Airport, Dayton, O. (Tel. TWinoaks 8-4661)
Mgr.-Purch.: J. E. Baird
Asst. Purch. Agent: W. S. Neff
Purch. Parts Buyer: F. A. White
Mgr.-Sales, Serv. & Contracts: C. E. Dixon
WN, PS, GS, GE, TS

AEROQUIP CORP.
300 S. East Ave., Jackson, Mich. (Tel. STate 2-0361)
Aircraft Sales Mgr.: K. R. Manning
MF, PS, GS, GH, TS, TR

AEROTEC CORP., THE
Pemberwyck Rd., Greenwich, Conn. (Tel. JEfferson 1-8400)
Purch. Agent: G. Gerstner
Sales Mgr.: M. J. Dodd
MF, WN, PS, GS, GH, GE

AERO-TEST EQUIPMENT CO., INC.
2615 W. Mockingbird Lane, Dallas 35, Tex. (Tel. FLeetwood 2-8421)
Chief Purch. Agent: J. H. Quire
Buyer: R. A. Clarke **MF, GS, GE, TS**

★AEROTEST LABORATORIES, INC.
129-11 18th Ave., College Point 56, N. Y. (Tel. INdependence 1-7272)
Purch. Agent: J. Yahm
Sales Mgr.: L. Permut **CO, TS**
★(See advertisement in this issue)

AEROTRON SUPPLY CO.
8504 S. Normandie Ave., Los Angeles 44, Calif. (Tel. PLeasant 3-3453)
Purch. Agent: Richard J. Greer
V. P.: John L. Scales **MF, WN, PS**

AEROVOX CORP.
740 Belleville Ave., New Bedford, Mass. (Tel. WYman 4-9661)
Purch. Agent: Robert Crabbe
Buyers: Edward Hickey, John Warren, Fred Graeben, Joe Desjarins
V. P.-Sales: Robert Hoagland **GE**

AHLBERG BEARING CO.
3025 W. 47th St., Chicago 32, Ill. (Tel. VIrginia 7-2313)
Purch. Agent: Harry F. Hagenauer
Sales Mgr.: M. G. McGregor **GS, GH**

AINSLIE CORP.
312 Quincy Ave., Quincy 69, Mass. (Tel. GRanite 2-8747)
Purch. Agent: L. D. Ainslie
MF, PS, GS, GE, CO, TS, TR

AIR FILTER CORP.
4554 W. Woolworth Ave., Milwaukee 18, Wis. (Tel. HOpkins 2-2800)
V. P.-Purch.: R. J. Breckheimer **GS**

AIR FRAME INSPECTION INC.
10801 Sessler St., South Gate, Calif. (Tel. TOpaz 1-6733)
Sales Mgr.: B. H. Smith

AIR LOGISTICS CORP.
3600 E. Foothill Blvd., Pasadena, Calif. (Tel. SYcamore 6-7191)
Dir.-Purch.: Charles J. Wilson
Dir.-Customer Relations: Eugene M. Armstrong
MF, PS, GS, GH, GE, CO, TS, TR

AIR PRODUCTS, INC.
Allentown, Pa. (Tel. HEmlock 5-9651)
Gen. Purch. Mgr.: F. B. Draug
MF, PS, GS, GH, TS

AIR REDUCTION SALES CO., DIV.-AIR REDUCTION CO., INC.
150 E. 42nd St., New York 17, N. Y. (Tel.

MUrray Hill 2-6700)
Gen. Purch. Agent: R. N. Chapin
Asst. Adv. & Sales Prom. Mgr.:
William C. Bettes MF, PS, GS

AIR SPEED TOOL CO.
1502 W. Slauson Ave., Los Angeles 47, Calif. (Tel. PLeasant 2-8340)
Gen. Mgr.: H. J. Thiessen
Asst. Gen. Mgr.: R. G. Zimmerman
Purch.: H. L. Johnson PS, GS, TS

AIRATERRA
620 Paula Ave., Glendale I, Calif. (Tel. CHapman 5-1196)
Purch. Agent: Harold Conley
Sales Mgr.: Don Butler

AIRBORNE ACCESSORIES CORP.
1414 Chestnut Ave., Hillside, N. J. (Tel. WA 6-1700)
Materials Mgr.: John J. Foley
Purch. Agent: Paul S. Marantz
Gen. Mgr.-Sales: W. Cortlyn Rhodes
WN, PS, GS, GH, GE, CO, TS, TR

AIRBORNE INSTRUMENTS LAB., INC.
1345 New York Ave., Huntington Station, N. Y. (Tel. MYrtle 2-6100)
Dir.-Procurement: George Hansen
Dir.-Sales: E. R. Godfrey
WN, PS, GS, GE, CO, TS, TR

AIRBORNE RESEARCH & DEVELOPMENT CORP.
7530 San Fernando Rd., Sun Valley, Calif. (Tel. STanley 7-9647)
Gen. Mgr.: Howard V. French
Chief Engr.: David H. Wilson
Chief Quality Control: Neil Boren
MF, WN, PS, GS

AIRCOM INC.
354 Main St., Winthrop, Mass. (Tel. OCean 3-3096)
Chief Engr.-Purch.: Robert A. Rivers
Purch. Dept.-Sales Mgr.: Edward J. Stack
GS, GE, CO, TS, TR

AIRCRAFT ARMAMENTS, INC.
Cockeysville, Md. (Tel. VAlley 5-8400)
Chief-Procurement: Blaine M. Swartz
V. P.-Sales: Robert B. Chapman, III
MF, WN, GS, GH, GE, TS, TR

AIRCRAFT EQUIPMENT DIV.-CONSOLIDATED DIESEL ELECTRIC CORP.
880 Canal St., Stamford, Conn. (Tel. DAvis 5-2261)
Dir.-Opns.: J. F. Campbell
Purch. Agent: J. Kistner
Chief, Quotations: C. Ziehl
V. P.-Sales: Gerald Rosenberg
PS, GS, GH

AIRCRAFT EQUIPMENT TESTING CO., INC.
1812 Fleet St., Baltimore 31, Md. (Tel. ORleans 5-8337)
Pres.: Harry P. Kupiec

AIRCRAFT FITTING CO., THE
701 N. Federal Hwy., Dania, Fla. (Tel. WAbash 3-2331)
Dir.-Purch.: Paul Hummel
Sales Mgr.: H. P. Borger MF, PS

AIRCRAFT MECHANICS, INC.
3200 N. Nevada Ave., Colorado Springs, Colo. (Tel. MElrose 2-7687)
V. P.-Purch.: Edwin Aro
Buyer: A. S. McCann
MF, WN, PS, GS, GH

AIRCRAFT POROUS MEDIA, INC.
30 Sea Cliff Ave., Glen Cove, N. Y. (Tel. 4-6320)
Purch. Agent: N. Friedman
Sales Mgr.: J. A. Whitwell PS, GS

AIRCRAFT PRODUCTS DIV.-CLINE ELECTRIC MFG. CO.
3405 W. 47th St., Chicago, Ill. (Tel. CLiffside 4-7500)
Production Mgr.: Harold Hicks
GS, GH

AIRCRAFT STANDARDS, INC.
2100 Colorado, Santa Monica, Calif. (Tel. EX 4-8606)
Purch. Agent: E. Barr
Comptroller: E. S. Carman
Chief of Mfg.: H. B. Plone
Sales Mgr.: E. J. Duggan
MF, GS, GH, TS

AIRDESIGN CORP.
241 Fairfield Ave., Upper Darby, Pa. (Tel. GRanite 4-8000)
Purch. Agent: T. Eisele
Sales Mgr.: Louis Martino GS, GE

AIRECO, INC.
2323 Second Ave. Carman, Schenectady, N. Y. (Tel. EXpress 3-3673)
Secy.: F. DiGennaro MF, PS, GS, TS

AIRFLYTE ELECTRONICS CO.
535 Ave. A, Bayonne, N. J. (Tel. HEmlock 6-2230)
Purch. Agent: Ben Novy
Buyer: D. Plutauro
Sales Mgr.: Milton Feinman
MF, WN, PS, GH, GE, TR

AIR-MARINE MOTORS, INC.
369 Bayview Ave., Amityville, N. Y. (Tel. AMityville 4-3700)
Purch. Agent: Paul Harrington
Sales Mgr.: David H. Thomas
PS, GH, GE

AIR-MAZE CORP.
25000 Miles Rd., Cleveland 28, O. (Tel. MOntrose 2-8000)
Dir.-Purch.: James Carson
Sales Mgr.: John Clem
MF, PS, GS, GE, TR

AIROIL PRODUCTS CO., INC.
69 Wesley St., South Hackensack, N. J. (Tel. DIamond 3-5200)

AIRTEMP CONSTRUCTION, DIV.-CHRYSLER CORP.
Dayton I, Ohio
Dir.: R. B. Stotz

AIRTRON, INC.
1123 W. Elizabeth Ave., Linden, N. J. (Tel. HUnter 6-1000)
Purch. Agent: H. Curran
Chief Sales Engr.: R. C. Kolts
MF, PS, GS, GH, GE, CO, TS, TR

AIRWORK CORP.
5245 N. W. 36th St., Miami Springs, Fla. (Tel. TUxedo 8-3467)
New Product Sales Mgr.: F. H. Lee
PS, GS, GE

AKRON BRASS MFG. CO., INC.
Wooster, Ohio (Tel. HOward 2-0070)
Purch. Agent: F. B. Watson
Sales Mgr.: Ray Kubec

ALAD ALUMINUM LADDER CORP.
7260 Melrose Ave., Los Angeles 46, Calif. (Tel. WEbster 4-5000)
Chief Engr.-Purch.: George W. Hughes, 1448 Signal Dr., Box 630, Pomona, Calif. (Tel. LYcoming 2-2478)
Gen. Sales Mgr.: F. A. von Baum
GH, GS

ALADDIN ELECTRONICS, DIV.-ALADDIN INDUSTRIES INC.
705 Murfreesboro Rd., Nashville 10, Tenn. (Tel. CH 2-3411)
Prod. Control Mgr.: F. G. Bassler
Buyer: J. Brock Stockes
V. P. & Gen. Mgr.-Sales: W. W. Stifler
GE, TS

ALAR PRODUCTS, INC.
1071 Power Ave., Cleveland 14, O. (Tel. PR 1-0015)
Purch. Agent: R. T. Maneely
Sales Mgr.: J. L. Egger PS

★**ALBANO CO. INC.**
549-555 W. 54th St., New York, N. Y. (Tel. PLaza 7-5888)
★(See advertisement in this issue)

ALBION INDUSTRIES, INC.
816 N. Clark St., Albion, Mich. (Tel. NAtional 9-3965)
Purch. Agent: C. W. Burns
Gen. Mgr.: J. F. Karmalski

ALCAR INSTRUMENTS, INC.
17 Industrial Ave., Little Ferry, N. J. (Tel. HUbbard 9-3040)
V. P.-Purch.: Louis R. Jeffrey, Jr.
PS, GS, GH, GE, CO, TS, TR

ALCO VALVE CO.
865 Kingsland Ave., St. Louis 5, Mo. (Tel. PArkview 5-2460)
Proc. Dir.: W. F. Helfrich
Buyers: Wm. C. Calvin & Jack DeCormier
Mgr.-Aircraft Sales: W. F. Lochmoeller
MF, PS, GS

ALDEN ELECTRONIC & IMPULSE RECORDING EQUIPMENT CO.
Washington St., Westboro, Mass. (Tel. FOrest 6-4467)
Chief Engr.-Purch.: S. C. Sviokla
Sales Mgr.: E. D. Cross
GE, CO, TS, TR

ALDEN PRODUCTS CO.
Brockton, Mass. (Tel. JUniper 3-0160)
Purch. Agent: A. Illsley
Sales Mgr.: N. Bump
MF, PS, GS, GH, GE, CO, TS, TR

ALDEN SYSTEMS CO.
Alden Research Ctr., Westboro, Mass. (Tel. FOrest 6-4467)
In Chg. Operations-Sales: W. P. Eggert
MF, GS, GH, CO, TS

ALFAX PAPER & ENGRG. CO.
Washington St., Westboro, Mass. (Tel. FOrest 6-4467)
Chief Engr.-Purch.: E. D. Cross
Plant Mgr.-Sales: S. C. Sviokla TR

AL-FIN DIV., FAIRCHILD ENGINE & AIRPLANE CORP.
Commack Rd., Deer Park, L. I., N. Y. (Tel. DEer Park 2-7211)
Dir.-Procurement: E. W. Hill
Chief Engr.-Purch.: G. T. Ladd
Sales: H. W. Crusey MF

ALFRED ELECTRONICS
897 Commercial St., Palo Alto, Calif. (Tel. DAvenport 6-6496)
Purch.: Fred W. Kruse, Jr. & Al Jew
Sales Mgr.: Paul N. Fulton
GE, CO, TS, TR

ALL AMERICAN AIRCRAFT PRODUCTS, INC.
1311 W. Pacific Coast Hwy., Harbor City, Calif. (Tel. DA 6-1584)
Purch. Agent: C. F. Bittle
Sales: E. Adler
MF, WN, PS, GS, GH, GE

ALL AMERICAN TOOL & MFG. CO.
8027 Lawndale Ave., Skokie, Ill. (Tel. ORchard 3-7084)
Gen. Mgr.-Purch.: S. K. Hein
Chief Engr.-Purch. & Sales: Robert O. Hein
TS

CODING	
Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

ALL BORO METAL PRODUCTS CO., INC.
610 Fenimore Rd., Mamaroneck, N. Y. (Tel. OWens 8-0104)
V. P.-Purch.: H. B. Maxwell
Purch.: J. J. Schnapp & H. M. Sterling
MF, PS, GH

ALLARD INSTRUMENT CORP.
146 E. Second St., Mineola, L. I., N. Y. (Tel. Pioneer 6-5895)
Plt. Supt.-Purch.: Norman M. Herman
Buyer: F. G. Haggerty GS, GE, TR

ALLEGANY INSTRUMENT CO., INC.
1091 Wills Mountain, Cumberland, Md. (Tel. PArkview 4-1200)
Purch. Agent: Miss Helen Whiteman
Sales Mgr.: James G. Ramsay
PS, GS, GH, GE, CO, TS, TR

ALLEGHENY LUDLUM STEEL CORP.
Oliver Bldg., Pittsburgh 22, Pa. (Tel. COurt 1-5300)
V. P.-Purch.: L. H. Bittner
V. P.-Sales: W. B. Pierce
MF, WN, PS, GS, GE, TR

A. K. ALLEN CO.
255 E. Second St., Mineola, N. Y. (Tel. Pioneer 7-5450)
Purch. Agent: Irving Charm
Sales: A. C. Kelly PS, GS

ALLEN AIRCRAFT PRODUCTS, INC.
Ravenna, O. (Tel. AX 6-9621)
Purch. Agent: Russ Lengs
Sales Mgr.: Wm. H. Salladay PS, GS

ALLEN MFG. CO.
133 Sheldon St., Hartford 2, Conn. (Tel. JA 2 6131)
Purch. Agent: Wm. A. MacDonald
V. P.-Sales: W. D. Horner MF, PS

★R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENT DIV.
333 Commerce St., N. W., Grand Rapids, Mich. (Tel. GL 6-8541)
Purch. Agent: F. C. Paterson
Mgr., Instrument Div.: G. T. Harrison
PS, GE, TR

★(See advertisement in this issue)

ALLIED CHEMICAL & DYE CORP., NITROGEN DIV.
40 Rector St., New York 6, N. Y. (Tel. HAnover 2-7300)
Dir.-Indust. Sales: John J. Porter PS

ALLIED CONTROL CO., INC.
2 E. End Ave., New York, N. Y. (Tel. BUtterfield 8-7403)
Purch. Agent: Carl Holland
Gen. Sales Mgr.: A. G. Zepp
PS, GS, GE, TR

ALLIED DECALS, INC.
8400 Hough Ave., Cleveland 3, O. (Tel. SW 1-6863)
Sales: Gordon R. Weigle

ALLIED ENGRAVING & STAMPING CO.
17-21 Elm St., Buffalo 3, N. Y. (Tel. CLeveland 3725)
Sales: D. Karnofsky
MF, WN, PS, GS, GE, CO, TS, TR

ALLIED PLASTICS SUPPLY CORP.
75 Cliff St., New York 38, N. Y. (Tel. BEekman 3-7377)
V. P.-Purch.: Raymond O. Vetter
MF, WN, PS, GS, GE, CO, TS, TR

ALLIED RESEARCH & ENGRG., DIV.-ALLIED RECORD MFG. CO.
6916 Santa Monica Blvd., Hollywood 38, Calif. (Tel. HOllywood 2-1251)
Purch. Agent: Jack Kalk
Sales Mgr.: Bruce C. Jones

ALLIED WITAN CO. INC.
P. O. Box 2770, 12500 Bellaire Rd., Cleveland 11, O. (Tel. WInton 1-2800)
Purch. Agent: S. J. Gibel
Sales Mgr.: George Gibel
PS, GS, GH, GE, TR

LOUIS ALLIS CO., THE
481 E. Stewart St., Milwaukee 1, Wisc. (Tel. HUmboldt 1-6000)
Dir.-Purch.: H. A. Larsen
V. P.-Sales: C. G. Skidmore GS, GH

ALLMETAL SCREW PRODUCTS CO., INC.
821 Stewart Ave., Garden City, L. I., N. Y. (Tel. Pioneer 1-1200)
Dir.-Purch.: P. Fishman
Purch. Agent: J. Segal
Buyer: F. Risteyn
Sales Mgr.: S. R. Marsh
MF, WN, PS, GS, GH

ALLOY PRECISION CASTINGS CO.
3855 W. 150th St., Cleveland 11, O. (Tel. CLearwater 2-3650)
Sales Mgr.: Walter S. Poremba
MF, PS

ALLOY STEEL CASTING CO.
202 County Line Rd., Southampton, Pa.

ALL-STATE WELDING ALLOYS CO., INC.
249-55 Ferris Ave., White Plains, N. Y. (Tel. WH 8-4646)
Purch. Agent: Charles J. Oleson
Adv. Mgr.-Purch.: Richard H. Mandel
Sales Mgr.: Lee S. Wade
MF, PS, GE, TR

ALPAR MFG. CORP.
2910 Spring St., Redwood City, Calif. (Tel. EM 8-4701)
Purch.: C. R. Parmenter
Sales: R. V. Laustrup TR

ALPHA INSTRUMENT CO.
43 Hempstead St., New London, Conn. (Tel. GIbson 2-2141)
Gen. Mgr.: Isadore A. Cohn
GS, GE, CO, TS, TR

ALPHA METALS, INC.
56 Water St., Jersey City, N. J. (Tel. HEnderson 4-6778)
Purch. Agent: Lawrence Turbow
Sales Mgr.: Harold Hertzog
MF, WN, PS, GS, GE, TR

ALPHA WIRE CORP.
200 Varick St., New York 14, N. Y. (Tel. ALgonquin 5-5400)
Purch. Agent: Sheldon Ellenoff
Asst. Purch. Agent: John Gallagher
Gen. Mgr.-Sales: Howard B. Saltzman
MF, PS, GS, GH, TS, TR

ALTAIR INC.
50 S. MacQuesten Pkwy., Mt. Vernon, N. Y. (Tel. MOunt Vernon 4-7300)
Purch. Agent: L. E. Odell
Sales Mgr.: J. J. Mancusi, Jr.
MF, PS, GS

ALTAMIL CORP.
225 Oregon St., El Segundo, Calif. (Tel. EAstgate 2-5520)
Purch. Dir.: Dave Davis
Purch. Agent: Al Duvall
V. P.-Sales: H. E. Blythe, Jr. MF, WN

ALTO SCIENTIFIC CO., INC.
855 Commercial St., Palo Alto, Calif. (Tel. DAvenport 4-4733)
Purch. Agent: Miss V. Barrett
Gen. Mgr.-Sales: David Cherry
PS, GS, GH, GE, CO, TS, TR

ALUMINUM ALLOYS CORP.
6650 W. Walton, Detroit 10, Mich. (Tel. TYler 8-5300)
V. P. & Gen. Mgr.: Stanley R. Day
MF, PS

ALUMINUM CO. OF AMERICA
1501 Alcoa Bldg., Pittsburgh 19, Pa. (Tel. ATlantic 1-4545)
V. P. in Chg. of Engrg. & Purch.: J. P. Haight
Gen. Purch. Agent: R. O. Keefer
Asst. Gen. Purch. Agent: T. O. English
V. P. & Gen. Sales Mgr.: R. V. Davies
MF, WN, PS, GS, GH, CO

ALWAC CORP.
13040 S. Cerise Ave., Hawthorne, Calif. (Tel. OR 8-5774)
Head-Purch.: R. J. Desbiens
Western Region Sales Mgr.: Wm. V. Crowley MF, GE, TR

AMATOM ELECTRONIC HARDWARE CO. INC.
88 Drake Ave., New Rochelle, N. Y. (Tel. BEverly 5-3838)
Purch. Agent: M. Nichols
Buyer: G. Marcus
V. P.-Sales: N. D. Frank
MF, WN, PS, GS, GH, GE, CO, TS, TR

AMBROID CO. INC.
Box 30, Weymouth 88, Mass. (Tel. EDgewater 5-6658)
Sales & Adv. Mgr.: A. E. Laneau MF

AMCO ENGRG. CO.
7333 W. Ainslie St., Chicago 31, Ill. (Tel. UNderhill 7-8500)
Sales Mgr.: R. C. Komarek

AMELCO, INC.
2040 Colorado Ave., Santa Monica, Calif. (Tel. EXbrook 3-7281)
Purch. Agent: William Scott, 11974 Wilshire Blvd., Los Angeles, Calif. (Tel. GRanite 8-0207)
Head Buyer: Angela Russo (Los Angeles)
Buyers: Mackie Carlyle & James Shaw (Los Angeles)
Expediters: Harvey Noel and Jack Craig (Los Angeles)
V. P.-Contract Administrator: Frank J. Bretzing
GS, GH, GE, CO, TS, TR

AMERAC INC.
Dunham Rd., Beverly, Mass. (Tel. WAlker 2-8610)
Sales Engr.: Owen Haszard
GS, GE, CO, TS, TR

AMERCOAT CORP.
4809 Firestone Blvd., South Gate, Calif. (Tel. LOrain 4-2581)
Purch. Agent: G. Groshong
V. P.-Sales: D. O. Lachmund
MF, WN, PS, TR

AMERICAN AEROPHYSICS CORP.
109 Sheldon St., El Segundo, Calif. (Tel. ORegon 8-3789)
Purch. Agent: W. C. Dunlop
MF, PS, GS

AMERICAN AGILE CORP.
P. O. Box 168, Bedford, O. (Tel. MO 2-6900)
Purch. Agent & Plt. Mgr.: F. W. Freedman
Exec. V. P. & Gen. Mgr.-Purch.: C. F. Freedman
Sales: F. C. Alten MF, WN, PS

AMERICAN AIR FILTER CO., DEFENSE PRODUCTS DIV.
310 3rd St., Rock Island, Ill. (Tel. 8-9311)
Purch. Agent: M. L. Marlaire
Buyer: H. Martin
Expediter: E. Ramser
Sales: N. Dahm MF, GS

AMERICAN BRAKE SHOE CO.
530 Fifth Ave., New York 36, N. Y. (Tel. OX 7-7000)
Purch. Agent: F. B. Newbert
MF, WN, PS, GS, GH, GE

AMERICAN BRAKE SHOE CO., ENGINEERED CASTING DIV.
10 Mt. Read Blvd., Rochester 11, N. Y. (Tel. GEnesee 8-6455)
Defense Prod. Mgr.: Richard A. Pinto
Sales V. P.: P. H. Clapp
MF, WN, PS, GS

AMERICAN BRAKE SHOE CO., KELLOGG DIV.
97 Humboldt St., Rochester 9, N. Y. (Tel. BUtler 8-2020)
Purch. Agent: D. S. Judd
Mgr.-Aircraft Prod. Sales: K. C. Binder
PS, GE

AMERICAN BRASS CO., THE
414 Meadow St., Waterbury, Conn. (Tel. PLaza 4-1121)
Gen. Purch. Agent: E. A. Lane
MF, WN, PS, GS, GH, GE, CO, TS, TR

AMERICAN BRASS CO., AMERICAN METAL HOSE DIV.
698 S. Main St., Waterbury 10, Conn. (Tel. PLaza 4-1121)
Div. Purch. Agent: W. S. Edwards
MF, PS, GS, GH

AMERICAN BRAZING ALLOYS CO.
P. O. Box 11, Pelham, N. Y. (Tel. MO 4-5858)

AMERICAN CAR & FOUNDRY DIV., ACF INDUSTRIES, INC.
30 Church St., New York 8, N. Y. (Tel. WOrth 4-3010)
V. P.-Purch.: P. B. Hoyt
Asst. V. P.-Purch.: H. Streader
V. P.-Mktg.: J. E. Angst
Dir. Defense Prod.-Sales: J. M. Gruitch
MF, WN, PS, GS, GH, CO, TR

AMERICAN CONVEYOR CO.
2133 S. Christiana Ave., Chicago 23, Ill. (Tel. LAwndale 1-2144)
Purch. Agent: George J. Handa
Sales Engr.: D. C. Colletti GS

AMERICAN CORD & WEBBING CO., INC.
374 Broadway, New York 13, N. Y. (Tel. BEekman 3-2326)
V. P.: R. H. Shapiro MF, WN, PS

AMERICAN ELECTRIC CABLE CO.
181 Appleton St., Holyoke, Mass. (Tel. JEfferson 9-9893)
Sales Mgr.: H. Shore
MF, PS, GS, GH, TS, TR

AMERICAN ELECTRICAL HEATER CO.
6110 Cass Ave., Detroit 2, Mich. (Tel. TRinity 5-2505)
Purch. Agent: Joseph B. Snaiar

AMERICAN ELECTRONIC LABS., INC.
121 N. Seventh St., Philadelphia 6, Pa. (Tel. WAlnut 5-8780)
Head-Purch.: Seymour Kalos
Purch. Agents: Jack Wojcik, Tony Iocono
WN, PS, GS, GE, CO, TS, TR

AMERICAN ELECTRONICS, INC.
655 W. Washington Blvd. (Mktg. Div.), Los Angeles 15, Calif. (Tel. RI 9-5361)
Sales Mgr.: Kenneth Sneed
MF, WN, PS, GS, GH, GE, CO, TS, TR

AMERICAN ELECTRONICS, INC., DATATRONICS DIV.
9463 W. Jefferson Blvd., Culver City, Calif. (Tel. TExas 0-7245)
Head-Purch.: J. Snedaker
Buyer: V. Gillette
Sub-Systems & Controls Chief, Appl. Engr.: Eric Swansson
Data Recording & Processing Chief, Appl. Engr.: Ken Williamson
MF, PS, GS, GE, CO, TS, TR

AMERICAN FELT CO.
Glenville, Conn. (Tel. JEfferson 1-8700)
Gen. Sales Mgr.: R. Power Fraser
MF, PS

AMERICAN FLEXIBLE COUPLING DIV., ZURN INDUSTRIES, INC.
1801 Pittsburgh Ave., Erie, Pa. (Tel. 2-2245)
Purch. Agent: Richard D. Wynne
Buyer: John Gleason

★AMERICAN GAGE & MACHINE CO.
5200 W. Kinzie St., Chicago 44, Ill. (Tel. EStebrook 9-1121)
★(See advertisement in this issue)

AMERICAN INSULATED WIRE CORP.
36 Freeman St., Pawtucket, R. I. (Tel. 6-0700) MF, PS, GS, TR

AMERICAN LA FRANCE CORP.
100 E. La France St., Elmira, N. Y. (Tel. 8181)
Purch. Agent: F. R. Baker
Asst. Purch. Agent: George Hughes
V. P.-Sales: G. J. Halpin GS

AMERICAN LAVA CORP.
Chattanooga 5, Tenn. (Tel. AMhurst 5-3411)
Purch. Agent: C. R. Hughes
Sales Mgr.: E. D. Bell
MF, WN, PS, GE, TS, TR

AMERICAN LIGHT ALLOYS, INC.
1265 McBride Ave., Little Falls, N. J. (Tel. CLifford 6-6000)
Sales Engr.: Duncan MacDonald MF

★AMERICAN MACHINE & FOUNDRY CO.
261 Madison Ave., New York 16, N. Y. (Tel. MUrray Hill 7-3100)
Chrm. & Chief Exec. Officer: Morehead Patterson
Vice Chrm.: Walter Bedell Smith
Pres.: Carter Burgess
Group Exec.-Defense Products: S. J. Childs
NOTE: All correspondence concerning products listed in this Directory should be addressed to
Defense Products Group
1101 N. Royal St., Alexandria, Va.
MF, WN, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

AMERICAN METRIX CORP.
40 Haddon Ave., Camden 3, N. J. (Tel. WO 3-4025) PS, CO, TS

AMERICAN NON GRAN BRONZE CO.
511 Old Lancaster Rd., Berwyn, Pa. (Tel. BErwyn 0240)
Purch. Agent: Charles H. Morris
MF, WN, PS, GE

AMERICAN OPTICAL CO., INSTRUMENT DIV.
Optical Ave., Keene, N. H. (Tel. ELmwood 2-3202)
Purch. Agent: George Howarth
WN, PS, GS, GH, GE, CO, TS, TR

AMERICAN PIPE & STEEL CORP.
2201 Commonwealth Ave., Alhambra, Calif. (Tel. CUmberland 3-2181)
Purch. Agent: D. G. Lane GS

AMERICAN POTASH & CHEMICAL CORP., NATIONAL NORTHERN DIV.
3030 W. Sixth St., Los Angeles 54, Calif. (Tel. DUnkirk 2-8231)
V. P.-Defense Contracts: George S. Wheaton MF, PS, TS

AMERICAN POWER JET CO.
705 Grand Ave., Ridgefield, N. J. (Tel. WH 5-8203) PS, GS

AMERICAN PRINTED CIRCUITS CO., INC.
104 Forrest St., Metuchen, N. J. (Tel. LIberty 8-5777)
Prod. Mgr.: Mrs. B. M. Weaver
PS, GS, GH, GE, TR

AMERICAN RESEARCH & MFG. CORP.
920 Halpine Ave., Rockville, Md. (Tel. HAzelwood 7-7116)
Purch. Agent: Robert A. Taylor
MF, PS, GS, GH, GE, CO, TS, TR

AMERICAN ROCKET CO.
P. O. Box 1112, Wyadotte, Mich. (Tel. LOgan 5-3408) MF, PS, GH, GE

AMERICAN SCREW CO
1680 W. Main St., Willimantic, Conn. (Tel. HArrison 3-6331)
Purch. Agent: Wallace A. Smedley
Asst. Purch. Agent: Grant Tuttle MF, PS

AMERICAN SILVER CO.
36-07 Prince St., Flushing 54, N. Y. (Tel. FLushing 3-8012)
Purch. Agent: Robert Bernstein
MF, WN, PS, GE, TS

AMERICAN SOLDER & FLUX CO.
19th & Willard Sts., Philadelphia, Pa. (Tel. BAldwin 6-1800)
Gen. Mgr.: M. H. Matz

AMERICAN SPEEDLIGHT CORP.
63-01 Metropolitan Ave., Middle Village 79, N. Y. (Tel. EV 1-2000)
Comptroller: Frank Denny
Purch. Agent: Irwin Wald

AMERICAN STANDARD PRODUCTS, INC.
3030 Main St., Hartford, Conn. (Tel. CHapel 9-7707)
Purch. Agent: Elliot Ginden MF, WN, PS

AMERICAN STEEL FOUNDRIES, HAMMOND DIV.
Hohman & Hoffman Sts., Hammond, Ind. (Tel. WEstmore 1-1900)
Div. Purch. Agent: L. D. Koontz
MF, WN, PS, GS, GH

AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Rockefeller Bldg., 614 Superior Ave., N.W., Cleveland 13, O. (Tel. TOwer 1-2000)
Purch. Agent: R. W. Berrett
Prod. Planning & Dev. Div.-Aircraft & Missiles: H. F. Powders
V. P.-Sales: H. M. Francis
MF, PS, GH, TS

AMERICAN SUPER-TEMPERATURE WIRES, INC.
W. Canal St., Winooski, Vt. (Tel. UNIversity 2-9636)
V. P.-Purch.: Frank E. Dickson
MF, PS, GS, GH, TS, TR

AMERICAN TELEVISION & RADIO CO.
300 E. 4th St., St. Paul 1, Minn. (Tel. CApital 2-3791)
Gen. Mgr.: Albert A. Goffstein
GS, GH, GE, TS, TR

AMERICAN TOOL CO.
Pinto Bldg., Kalamazoo, Mich. (Tel. Fireside 5-6191) PS

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

★AMERICAN TUBE BENDING CO., INC.
7 Lawrence St., New Haven, Conn. (Tel. STate 7-2131)
Purch. Agent: A. L. Shumway
V. P.: H. W. Jones, III
Supt.: C. von Allmen
Sales Mgr.: C. T. Novak
MF, PS, GS, GH, TR
★(See advertisement in this issue)

AMERICAN WELDING & MFG. CO., THE
Dietz Rd., Warren, O. (Tel. 3-2531)
Purch. Agent: C. L. Miller
Buyer: D. W. Parker
Buyer-Steel Sects.: G. L. Madigan
Buyer-Misc. Supplies: D. C. Remalia
V. P.-Sales: M. R. Minnick
MF, WN, PS, GS, GH, GE, TS

AMGLO CORP.
4333 N. Ravenswood Ave., Chicago 13, Ill. (Tel. BUckingham 1-2727)
Purch.: C. M. Bobka
GS, GE, CO, TS, TR

AMPCO METAL, INC.
1759 S. 38th St., Milwaukee 46, Wisc. (Tel. MItchell 5-3750)
MF, WN, PS, GH, GE

AMPLEX DIV.-CHRYSLER CORP.
P. O. Box 2718, Detroit 31, Mich. (Tel. WAlnut 1-6733)
Sales Mgr.: K. H. Kuhlen
MF, WN, PS, GS, GH, GE, TR

AMPLIFIER CORP. OF AMERICA
398 Broadway, New York 13, N. Y. (Tel. WOrth 6-2929)
Purch. Agent: M. R. Ellis
Sales Mgr.: A. J. Gillette
GS, GE, CO, TS

AMTHOR TESTING INSTRUMENT CO., INC.
45 Van Sinderen Ave., Brooklyn 7, N. Y. (Tel. DIckens 6-8841)
Purch. Agent: Al Littmann
Sales Mgr.: Albert Tintner **CO, TS**

ANACHROME CORP.
10647 S. Garfield Ave., South Gate, Calif. (Tel. LO 4-3381)
Dir.-Sales: Joseph E. Trankla **MF, WN**

ANADITE INC.
10630 Sessler St., South Gate, Calif. (Tel. LO 7-0511)
Purch. Agent: Clarence Edwards
Dir.-Sales: Stanley M. Buckley **MF**

ANALOGUE CONTROLS, INC.
39 Roselle St., Mineola, L. I., N. Y. (Tel. PIoneer 2-8901)
V. P.-Sales: E. J. Garrett
MF, WN, PS, GS, GE, TS, TR

ANCHOR COUPLING CO. INC.
342 N. Fourth St., Libertyville, Ill. (Tel. 2-1360) **MF, PS, GS**

ANCHOR METAL CO. INC.
966 Meeker Ave., Brooklyn, N. Y. (Tel. ST 2-7090)
Sales: H. Drapkin
MF, WN, PS, GS, GH, GE, CO, TR

ANCHOR PACKING CO., THE
401 N. Broad St., Philadelphia 8, Pa. (Tel. WAlnut 2-1343) **MF, PS, GS**

ANCHOR SPECIALTY MFG. CO. INC.
300 Hollister Rd., Teterboro, N. J. (Tel. AT 8-1939)
Purch.: Wm. Zablocky
PS, GS, GH, GE, TS

ANDERSEN LABS., INC.
501 New Park Ave., West Hartford, Conn. (Tel. ADams 3-4491)
Purch. Agent: Richard Smith
Sales Mgr.: Harry W. Stewart
GE, CO, TS, TR

ANDERSON, GREENWOOD & CO.
1400 N. Rice Ave., Bellaire, Tex. (Tel. MAdison 3-2343)
Purch. Agent: C. J. Scallan
Sales Mgr.: W. W. Hering
PS, GS, GH, TR

ANDREW CORP.
363 E. 75th St., Chicago, Ill. (Tel. TRiangle 4-4400)
Purch. Agent.: John Cornyn
Dir.-Mktg.: Robert P. Lamons
Sales Mgr.: Robert Bickel
WN, PS, GS, GH, GE, TS, TR

ANNIN CORP., THE
6570 Telegraph Rd., Los Angeles 22, Calif. (Tel. RAymond 3-4547)
Purch. Agent: Nelson J. Jacobs
Asst. Purch. Agent: Herbert K. Gussler
Sales Mgr.: Henry C. Earle, Jr.
PS, GS

ARTHUR ANSLEY MFG. CO.
New Hope, Pa. (Tel. AXtel 7-2711)
Purch.: Arthur C. Ansley **GE, TR**

ANSONIA WIRE & CABLE CO., THE
111 Martin St., Ashton, R. I. (Tel. PAwtucket 6-6300)
Purch. Agent.: J. A. Milner
Gen. Sales Mgr.: A. J. W. Novak
MF, PS, GS, GH, TS, TR

ANSUL CHEMICAL CO.
1 Stanton St., Marinette, Wisc. (Tel. REdwood 5-7411)
Mgr.-Purch.: Lee O'Leary
V. P.-Sales: L. C. McKesson **GS**

ANTLAB INC.
6330 Proprietors Rd., Worthington, O. (Tel. TUxedo 5-5396)
Gen. Mgr.: M. Brilliant
Prod. Mgr.: Ralph L. Sorensen
PS, GS, GE, CO, TS, TR

★ANTON ELECTRONIC LABS., INC.
1226 Flushing Ave., Brooklyn 37, N. Y. (Tel. EVergreen 6-5715)
Purch. Agent: Bernard Neveloff
Dir.-Sales: George Weinman
MF, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

APPLIED DESIGN CO.
1807 Elmwood Ave., Buffalo 7, N. Y. (Tel. DElaware 9595)
Purch. Agent: D. J. Stonish
V. P.-Contracts: H. E. Hill
MF, PS, GS, GH

APPLIED DYNAMICS CORP.
32 N. Main St., Natick, Mass. (Tel. OLympic 3-5271)
V. P.-Purch.: R. G. Ahlquist
MF, PS, GS, GH, GE, TS, TR

APPLIED RESEARCH INC.
76 S. Bayles Ave., Port Washington, N. Y. (Tel. 7-8707)
Purch.: F. Henrich
Sales Mgr.: C. G. Costas **GE, TR**

APPLIED RESEARCH LABS.
3717 Park Place, Glendale, Calif. (Tel. CHapman 5-5524)
Material Mgr.: J. D. McKim (Tel. CHurchill 9-6193)
Buyers: James Reddy & Donald Nadell (Tel. CHurchill 9-6193)
Gen. Sales Mgr.: William E. Davis
CO, TS, TR

ARCH GEAR WORKS INC.
97 Holmes St., North Quincy, Mass. (Tel. PR 3-8801)
Purch. Agent: R. M. Allen
Purch. Asst.: D. Purdy
Sales Mgr.: Robert W. Gray
PS, GS, GE

ARCO CO., THE
7301 Bessemer Ave., Cleveland 27, O. (Tel. MIchigan 1-1170)
Purch. Agent: Lon Esther
Asst. Purch. Agent: George Otto
Sales Mgr.-Maintenance Sales: Dan G. Kloss
Sales Mgr.-Product Finishes: Ben F. Edman
MF, WN, GE, TS

ARENBERG ULTRASONIC LABORATORY, INC.
94 Green St., Jamaica Plain 30, Mass. (Tel. JA 2-8640)
Pres.: David L. Arenberg
GE, CO, TS, TR

ARENS CONTROLS, INC.
2017 Greenleaf St., Evanston, Ill. (Tel. DAvis 8-4700)
Purch. Agent: Fred W. Green
Dir.-Sales: Calhoun Norton
MF, PS, GS, GH, TS

ARIES LABORATORIES, INC.
45-33 Davis St., Long Island City 1, N. Y. (Tel. RAvenswood 9-9001)
Purch. Agent: H. Grisar
Sales Mgr.: William Stern **MF, WN**

ARISTOCRAT PLASTICS, INC.
23-25 Sussex Ave., Newark, N. J. (Tel. MArket 3-4692)
Pres.: Arthur Meier **MF, PS, GE, TR**

ARKWIN INDUSTRIES, INC.
648 Main St., Westbury, L. I., N. Y. (Tel. EDgewood 3-2640)
Purch.: Hank Baufr
V. P.-Sales: Julius Kendall
MF, WN, PS, GS, GH, GE, TS

ARMA DIV.-AMERICAN BOSCH ARMA CORP.
Roosevelt Field, Garden City, N. Y. (Tel. PIoneer 2-2000)
Mgr.-Procurement: George J. Ryan
Asst. Mgr.-Procurement (Subcontr.): Fred M. Seitz
Asst. Mgr.-Procurement (Spec. Proj.): James J. Dougherty
Asst. Mgr.-Procurement (Gen.): Charles F. Bartram
Asst. to Mgr.-Procurement: Walter Rammler
Asst. to V. P.-New Proj.-Defense-Sales: F. A. Rutz **PS, GS, GE, CO**

ARMCO STEEL CORP.
703 Curtis St., Middletown, O. (Tel. GArden 2-2711)
Purch.: J. S. Thomas
Sales: L. T. Johnston **MF, PS**

ARMITE LABS.
6609 Broad St., Los Angeles 1, Calif. (Tel. LUdlow 7-7744) **MF, PS**

ARMOUR & CO.
N. Benton & Webb Sts., Alliance, O. (Tel. 1 3511)
Purch. Agent: H. M. Wilson
Gen. Sales Mgr.-Coated Abrasives: H. L. Heiniger
Gen. Sales Mgr.-Cushion Prod.: J. P. Coughlin

ARMSTRONG CORK CO.
W. Liberty St., Lancaster, Pa. (Tel. EXpress 7-5151)
Gen. Purch. Agent: M. L. Lampe
Asst. Gen. Purch. Agent: W. A. Abel
Gen. Sales Mgr.: W. B. Tucker
MF, PS

ARMSTRONG PRODUCTS CO.
P. O. Box 1-MG, Warsaw, Ind. (Tel. AMherst 7-3226)
Mgr.: F. E. Harrison **MF, WN**

ARNO ADHESIVE TAPES, INC.
U. S. 20 at Ohio St., Michigan City, Ind. (Tel. TRiangle 4-3235)
Purch. Agent: R. L. Scholl
Sales Mgr.: M. J. Bost **MF, PS, TR**

ARNOLD ENGRG. CO., THE
P. O. Box G, Marengo, Ill. (Tel. Chicago ANdover 3-6300; Marengo JOrdan 8-7251)
Purch. Agent: R. L. Pottinger
Buyer: J. Strain
Sales Mgr.: Benjamin Falk
MF, PS, GS, GE, TR

ARNOLT CORP.
Argonne Rd., Warsaw, Ind. (Tel. AMhurst 7-7111)
Dir.-Purch.: Roger H. Davis
Purch. Agent: Carl D. Schultz
Expediter: Larry Yeiter
Contr. Admin.: H. M. Henderson
MF, WN, PS, GS, GH, TS

ARNOUX CORP.
11924 W. Washington Blvd., Los Angeles 66, Calif. (Tel. TExas 0-5371)
Purch. Agent: George Pesner
Asst. Purch. Agents: Darlene Thompson & Conrad J. Doerr

ARO EQUIPMENT CORP., THE
Bryan, O. (Tel. 6-1161)
Purch. Dir.: D. M. Nixon
Purch. Agent, Aircraft Div.: C. E. DeGroff
Sales Mgr.-Aircraft: D. W. Orrick, Jr.
MF, PS, GS, GH, GE, TS, TR

ARROW-HART & HEGEMAN ELECTRIC CO., THE
103 Hawthorne St., Hartford 6, Conn.

ARROWHEAD PRODUCTS, DIV.-FEDERAL-MOGUL-BOWER BEARINGS, INC.
2300 Curry St., Long Beach 1, Calif. (Tel. NEvada 6-0571)
Buyers: Sylvia Ketchpaw, Margaret Grant, Lloyd Johnson
Sales: Arnold J. Dovey
MF, WN, PS, GS, GH

ART SPECIALTY CO.
3720 N. Milwaukee Ave., Chicago, Ill. (Tel. KIldare 5-6607)

ART WIRE & STAMPING CO.
227 High St., Newark 2, N. J. (Tel. HUmboldt 4-2100)
Purch. Agent: Fred Riedmuller
Sales: Nils Johnson MF, WN, PS, GE

ARTOS ENGRG. CO.
2757 S. 28th St., Milwaukee 46, Wisc. (Tel. MItchell 5-6010)
Shop Supt.: Hubert Mueller
Sales Mgr.: Haakon T. Randar
MF, PS, GS

ARWOOD PRECISION CASTING CORP.
321 W. 44th St., New York, N. Y. (Tel. JUdson 2-4210)
Purch. Agent: Frank G. Xacker
V. P.-Sales: Wm. O. Sweeny MF, PS

ASBESTOS DIV., WORLD COMMERCE CORP. S. A.
445 Park Ave., New York 22, N. Y. (Tel. MUrray Hill 8-3800)
V. P.: John B. Okie MF

ASHLAND ELECTRIC PRODUCTS, INC.
32-02 Queens Blvd., Long Island City 1, N. Y. (Tel. EXeter 2-4010)
Purch. Agent: E. R. Obermann
Sales Mgr.: C. W. McElhiney
PS, GH, GE, TR

ASSEMBLY PRODUCTS, INC.
75 Wilson Mills Rd., Chesterland, O. (Tel. Cleveland-HAmilton 3-4436)
Purch. Agent: Robert Foltz
Sales Mgr.: Robert Pugsley
PS, GS, GE, CO, TS, TR

ASSOCIATED AMERICAN WINDING CO., INC.
750 St. Ann's Ave., New York 56, N. Y. (Tel. CYpress 2-5050)
Chief Purch. Agent: N. Goldman
Sales Mgr.: G. B. Franklin
PS, GS, GH, GE, TR

ASSOCIATED CO., INC.
1441 S. McLean Blvd., Wichita, Kans. (Tel. HObart 4-6379)
Material Mgr.-Purch.: Gene Garrison
Buyer Supervisor: Eldon Long
Exec. V. P.-Sales: W. W. Grisamore
MF, WN, PS, GS, GH

ASSOCIATED ENGINEERS, INC.
P. O. Box 1628, Springfield, Mass. (Tel. RE 4-6431)
Purch. Agent: A. E. Chalfin
Gen. Sales Mgr.: George L. Parrish
CO, TS

ASSOCIATED RESEARCH, INC.
3779 W. Belmont Ave., Chicago 18, Ill. (Tel. COrnelia 7-4040)
Purch. Agent: J. W. Bente
V. P.-Sales: Richard W. Inman
GE, CO, TS, TR

ASSOCIATED TESTING LABS., INC.
135 Clinton Rd., Caldwell, N. J. (Tel. CAldwell 6-7407)
Chief Engr.-Purch.: William Tonkowich
Proj. Engr.: Ted Wirth
Engrg. Sales Mgr.: Bernard Novack
PS, GS, CO, TS

ASTRODYNE
McGregor, Texas (Tel. GRanite 5-2811)
Contracts & Proposals: Kenneth P. Johnson

ATCO PULLEY CORP.
159 Simpson St., Wilkes-Barre, Pa. (Tel. VAlley 5-2791)
V. P.-Purch.: Marcus F. Hozempa
Sales Mgr.: John F. Hoppe PS, GE

ATKOMATIC VALVE CO., INC.
545 W. Abbott St., Indianapolis, Ind. (Tel. MElrose 8-6545)
Sales Mgr.: S. Wayne Gailey GS

ATLANTIC ENGRAVERS, INC.
52 Ocean Ave., Amityville, N. Y. (Tel. AM 4-5088)
V. P.-Purch.: Wayne Fajans
MF, WN, PS, GE, TS, TR

ATLANTIC INSTRUMENT CORP., SUB.-AMERICAN ELECTRONICS, INC.
90 Broadway, Norwood, Mass. (Tel. NO 7-2638)
Mgr.-Planning Dept.-Purch.: Dan Conley
Purch. Agent: Steve Lydon
Sales Mgr.: D. L. Thomas
MF, WN, PS, GS, GH, GE, CO, TS

ATLANTIC METAL HOSE CO., INC.
308 Dyckman St., New York City 34, N. Y. (Tel. LOrraine 9-5400)
Purch. Agent: David M. Fuchs

ATLANTIC RESEARCH CORP.
901 N. Columbus St., Alexandria, Va. (Tel. KIng 9-7500)
Purch. Agent: Wilbur H. Smith
Mgr.-Development: DeWitt O. Myatt
Mgr.-Precontract Engrg.: Daniel A. McBride
MF, WN, PS, GS, GE, CO, TS, TR

ATLAS ASBESTOS CO.
409 Walnut St., North Wales, Pa. (Tel. OXbow 9-4851)
Purch. Agent: L. C. Morrell
Sales Mgr.: G. F. Hopkins MF, PS

ATLAS BRASS FOUNDRY
1901 Santa Fe Ave., Los Angeles 21, Calif. (Tel. TRinity 6695)
Secy.: K. A. Johnston PS, GH

ATLAS E-E CORP.
47 Prospect St., Woburn, Mass. (Tel. WOburn 2-5390)
Purch. Agent: R. A. Joyce
MF, WN, PS, GS, GH, GE, TS, TR

ATLAS RESISTOR CO.
1128 Madison St., Chester, Pa. (Tel. CHester 3-3341)
Secy.: S. Seidman GE

ATTLEBORO REFINING CO., INC.
42 Union St., Attleboro, Mass. (Tel. ATtleboro 1-3705)
Plt. Supt. & V. P.-Purch.: Edward F. Towle
Sales Mgr.: John H. Quebman
MF, WN, PS, GE, TR

AUBURN MFG. CO., THE
Stack St., Middletown, Conn. (Tel. Diamond 6-6631)
Purch. Agent & Sales Mgr.: M. B. Weiner
MF, WN, PS, GS, GE, TR

AUBURN SPARK PLUG CO., INC.
89 York St., Auburn, N. Y. (Tel. 2-9501)
V. P.-Purch.: A. R. Nolin
Supt.: Leo Bates
Sales Mgr.: James Greene
MF, WN, PS, GS, GH, GE, CO, TS, TR

AUDIO INSTRUMENT CO., INC.
133 W. 14th St., New York 11, N. Y. (Tel. ORegon 5-7820)
Sales Mgr.: C. J. LeBel CO, TS

AUDIO-MASTER CORP.
17 E. 45th St., New York 17, N. Y. (Tel. OXford 7-0725)
Purch.: Herbert Rosen TR

AUGAT BROTHERS, INC.
33 Perry Ave., Attleboro, Mass. (Tel. 1-2202)
Sales: Robert S. Laurence MF, GE

AUREX CORP.
1117 N. Franklin St., Chicago 10, Ill. (Tel. WHitehall 4-1117)
Wks. Mgr.: Al Whyte
V. P.-Sales: E. E. Huth

AUSTENAL INC.
224 E. 39th St., New York 16, N. Y. (Tel. OXford 7-5656)
Purch. Mgr.: A. D. Repko
Asst. Purch. Mgr.: W. Riley
Sales Mgr.: R. L. Wiseman MF, PS

AUSTIN CO., THE, SPECIAL DEVICES DIV.
76 9th Ave., New York 11, N. Y. (Tel. WAtkins 4-3630)
Purch. Agent: H. W. Hunsberger
Sales: W. G. Birkel TS, TR

AUSTIN-WESTERN, CONSTRUCTION EQUIP. DIV.-BALDWIN-LIMA-HAMILTON CORP.
601 N. Farnsworth Ave., Aurora, Ill. (Tel. 7-8753)
Dir.-Purch.: J. D. McMakin
Sales Mgr.: J. A. Fitzenz GS, GH

AUTO-CONTROL LABS., INC.
333 S. Hindry Ave., Inglewood 1, Calif. (Tel. ORegon 8-4934)
Chief Engr.: Bob Lieberman
Engr. (Environmental Sec.): Chuck R. Knokey
MF, PS, GS, GH, GE, TS

AUTOMATIC ELECTRIC SALES CORP.
Northlake, Ill. (Tel. FIllmore 5-7111)
Gen. Purch. Agent: W. S. Cadwell
GH, GE, TS, TR

CODING	
Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

AUTOMATIC & PRECISION MFG. CO.
252 Hawthorne Ave., Yonkers, N. Y. (Tel. YOnkers 8-2010)
Purch. Agent: Clay Brandt
Buyer: Joan Misley
Sales Mgr.: Riva Solins
MF, PS, GS, GH, GE, TR

AUTOMATIC SWITCH CO.
Hanover Rd., Florham Park, N. J. (Tel. FRontier 7-4600)
Purch. Agent: Harold W. Hyland
Valve Sales Mgr.: R. F. McCormick
MF, PS, GS, GH, GE, TR

AUTOMETRIC CORP.
1501 Broadway, New York, N. Y. (Tel. BRyant 9-8700)
Purch. Agent: William Matzen

AUTOMOTIVE & AIRCRAFT DIV.-AMERICAN CHAIN & CABLE CO., INC.
601 Stephenson Bldg., Detroit 2, Mich. (Tel. TRinity 5-4104)
Purch.: H. C. Wenpelcke, Adrian, Mich.
V. P.-Sales Mgr.: Harry Williams
GH, GE, TS

AUTONETICS, DIV.-NORTH AMERICAN AVIATION, INC.
9150 E. Imperial Hwy., Downey, Calif. (Tel. LUdlow 3-6111)
Material Dir.: C. R. Raftery, 201 W. Manville St., Compton, Calif. (Tel. NEwmark 2-5721)
Purch. Agent: S. D. Zemansky, Compton, Calif.
Dir.-Mktg.: Charles A. Wolf
MF, PS, GS, GH, GE, CO, TS, TR

AUTOSCREW CO.
216 W. 18th St., New York, N. Y. (Tel. WA 9-3137)
Gen. Mgr.: H. C. Levi **MF, WN**

AUTOTRON, INC.
3629 N. Vermilion St., Danville, Ill. (Tel. 650)
V. P.-Purch.: M. Gieseke
PS, GH, GE, CO, TS, TR

AUTOTRONICS INC.
Box 812, Rt. 1, Florissant, Mo. (Tel. TEmple 7-3565)
V. P.-Purch. & Sales: E. F. White
Production Mgr.: A. F. Boaus

AUTO-VALVE INC.
12 Malden Ave., Dayton 27, O. (Tel. AMherst 3 8273)
Purch. Agent: Anthony P. Barcus
Gen. Mgr.: Ted L. G. Calvo **PS, GS**

★AVCO MFG. CORP., CROSLEY DIV.
1329 Arlington St., Cincinnati, Ohio (Tel. KIrby 1-6600)
Purch. Agent: Arthur J. Verax
V. P.-Mktg. Defense Products: Clarence G. Felix
MF, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

AVCO RESEARCH LAB., DIV.-AVCO MFG. CORP.
2385 Revere Beach Parkway, Everett, Mass. (Tel. DUnkirk 9-2300)
Purch. Agent: Harold Bloom
Exec. Asst. to Dir.: F. C. Durant, III

AVIATION DEVELOPMENTS INC.
210 S. Victory Blvd., Burbank, Calif. (Tel. VIctoria 9-4631)
Purch. Agent: Allan F. Devine
Sales Mgr.: Neil L. Hanson
MF, WN, PS, GS

AVICA CORP.
P. O. Box 180, Newport, R. I. (Tel. VIking 6 [illegible]
Purch. Mgr.: D. J. Mulholland

Chief Sales Engr.: R. S. Weiss
MF, PS, GS, GH

AVIEN, INC.
58-15 Northern Blvd., Woodside 77, N. Y. (Tel. YEllowstone 2-4600)
Mgr.-Purch.: Clifford Napolitano
Mktg. Mgr.: H. H. Georgens
GH, GE, CO, TS, TR

AVION DIV., ACF INDUSTRIES, INC.
11 Park Place, Paramus, N. J. (Tel. COlfax 1-4100)
Purch. Agent: W. Bingham
Sales Mgr.: John A. Curtis

AVNET CORP.
8966 National Blvd., Los Angeles 34, Calif. (Tel. TExas 0-6141)
Purch. Agent: Norman Karchem
Sales Mgr.: M. G. Newberger
PS, GS, GE, CO, TS, TR

AVONDALE CO., THE
260 Happ Rd., Northfield, Ill. (Tel. AMB 2-0342)
Purch.: Paul Manning
Sales: H. N. Limback
MF, WN, PS, GS, GH, GE

AXEL ELECTRONICS
134-20 Jamaica Ave., Jamaica, N. Y. (Tel. REpublic 9-1700)
Purch. Agent: Robert H. Elkes
Asst. Purch. Agent: David Schulman
Sales Mgr.: Joseph P. O'Donnell
GE, TR

AXLER ASSOCIATES INC.
102-42 43rd Ave., Corona 68, N. Y. (Tel. HAvemeyer 9-7718)
Purch. Agent: K. Hillman
Sales: M. Axler **GS, GE, TR**

B. & C. INSULATION PRODUCTS, INC.
490 Lincoln Hwy., Iselin, N. J. (Tel. LIberty 8-0815)
Gen. Mgr.: Bernard Sherman **MF, PS**

B & F INSTRUMENTS, INC.
4732 N. Broad St., Philadelphia 41, Pa. (Tel. DAvenport 9-2828)
V. P.-Purch.: C. E. Stufflebeam
Chief Purch. Clk.: B. Snyder
PS, CO, TS, TR

B G CORP., THE
321 Broad Ave., Ridgefield, N. J. (Tel. WHitney 5-8800)
Purch. Agent: Melville Miller
Dir.-Sales & Engrg.: Robert W. Brattvet
MF, WN, PS, GH, TR

B & H INSTRUMENT CO., INC.
3479 W. Vickery Blvd., Fort Worth, Tex. (Tel. EDison 6-7243)
Purch. Agent: Dwight Adams
Asst. Purch. Agent: John Siggins
Sales Mgr.: Leon H. Becker **PS, CO**

BJ ELECTRONICS, BORG-WARNER CORP.
3300 Newport Blvd., Santa Ana, Calif. (Tel. KImberly 5-5581)
Purch. Agent: H. E. Schuyler
Sales Mgr.: C. B. Smith
PS, GS, GE, CO, TS, TR

BLC POROUS MATERIALS CO.
809 San Antonio Rd., Palo Alto, Calif. (Tel. YO 8-1755)
Purch.: Nick Sheppel

BABCOCK & WILCOX CO., TUBULAR PRODUCTS DIV.
Beaver Falls, Pa. (Tel. Beaver Falls 2100)
V. P.: J. S. Anderson **MF, PS**

SEMON BACHE & CO.
636 Greenwich St., New York 14, N. Y. (Tel. WA 4-2121)
Purch.: Henry Del Tosto
Sales: B. Newton **MF, PS, GE**

BACON INDUSTRIES, INC.
192 Pleasant St., Watertown 72, Mass. (Tel. WAtertown 4-5000)
Purch. Agent: Kenneth H. Barton
Sales Mgr.: Eldon H. Fay
MF, WN, PS

N. S. BAER CO.
1-11 Montgomery St., Hillside, N. J. (Tel. MUrdock 8-2250)
Office Mgr.: P. J. Stec
Sales Mgr.: S. W. Nette **MF, WN, PS**

BAIRD-ATOMIC, INC.
33 University Rd., Cambridge 38, Mass. (Tel. UNiversity 4-7420)
V. P.-Purch.: Russell P. Mahan
V. P.-Mktg.: F. L. Foster, Jr.
PS, GS, GE, CO, TS, TR

BAKER STEEL & TUBE CO.
1540 Calzona St., Los Angeles 23, Calif. (Tel. ANgelus 3-7231)
Asst. Gen. Mgr.: C. L. Baker
Sales Mgr.: H. E. Byerrum

BALCO RESEARCH LABS., INC., CAPACITOR DIV.
49-53 Edison Place, Newark, N. J. (Tel. MItchell 3-5200)
Purch.: Bob Nobel **GE, TR**

BALDWIN-LIMA-HAMILTON CORP., ELECTRONICS & INSTRUMENTATION DIVS.
42 4th Ave., Waltham 54, Mass. (Tel. TW 4-6700)
Purch. Agent: R. A. Welch
Asst. Purch. Agent: R. Lepore
Buyers: C. W. Jiggetts, G. A. Chadwell & R. Lauranzano
Gen. Sales Mgr.: William Kerr
PS, GS, GH, CO, TS, TR

BALLANTINE LABS., INC.
Boonton, N. J. (Tel. DEarfield 4-1432)
V. P.-Purch.: Frank R. Zayac
GS, GE, CO, TS, TR

BALLASTRAN CORP.
1701 N. Calhoun St., Fort Wayne 7, Ind. (Tel. EAstbrook 2285)
Purch.: H. L. Matthias
Chief Engr. & Gen. Mgr.: Wm. Weir
TR

BALLYMORE CO.
Lincoln & Garfield Aves., West Chester, Pa. (Tel. OWen 6-3250)
Gen. Mgr.: William B. Hart
Sales Mgr.: Harry G. Westerfield
GS, GE, TS, TR

BALTEAU ELECTRIC CORP.
5 New St., Stamford, Conn. (Tel. DA 4-6118)
Div. Mgr., X-Ray Sales: Fred C. Sarchet

ALFRED W. BARBER LABS.
32-44 Francis Lewis Blvd., Flushing 58, N. Y. (Tel. IN 3-3306)

BARBER-COLMAN CO.
P. O. Drawer 99, Rockford, Ill. (Tel. 8-6833)
Purch. Agent: D. R. Farquhar
Sales Mgr.: R. A. Baird
PS, GS, GE, TS, TR

BARDEN CORP., THE
33 E. Franklin St., Danbury, Conn. (Tel. PIoneer 3-3885)
Purch. Agent: W. R. Ferguson
Buyer: K. A. Taylor
V. P.-Sales: Alphe G. Jarreau
PS, GS, GE

BARIUM & CHEMICALS, INC.
Lake Co. Nat. Bank Bldg., Willoughby, O. (Tel. WI 2-5151)
V. P.-Chg. of Purch.: Douglas Naylor
V. P.-Sales & Adv.: George H. Merz
MF, WN, PS, GS

BARKER SALES CO.
996-8 Edgewater Ave., Ridgefield, N. J.

(Tel. WHitney 3-2477)
Purch.: J. Donovan
Sales: T. R. Cox
MF, PS, GS, GH, GE, TR

BARKSDALE VALVES
5125 Alcoa Ave., Los Angeles 58, Calif. (Tel. LUdlow 7-6181)
Purch. Agent: H. Lembke
V. P.-Sales: M. C. Nelson PS, GS, GE

BARNES DEVELOPMENT CO.
213 W. Baltimore Ave., Lansdowne, Pa. (Tel. MAdison 6-3294)
Head-Purch.: Arnold W. Miller
Purch.: George W. Barnes & John N. Natter
Sales Mgr.: James W. Barnes

BARNES ENGRG. CO.
30 Commerce Rd., Stamford, Conn. (Tel. FIreside 8-5381)
Purch. Agent: James D. Bennett

BARNSTEAD STILL & DEMINERALIZER CO.
2 Langsville Terr., Boston 31, Mass. (Tel. JA 4-3100)
Purch. Agent: J. C. Mullan
Sales Mgr.: D. G. Miller PS, GS

BAR-RAY PRODUCTS, INC.
209 25th St., Brooklyn 32, N. Y. (Tel. SOuth 8-1020)
MF, WN, PS, GS, TS

W. L. BARRETT CO., THE
School St., Bristol, Conn. (Tel. LUdlow 2-7487)
Purch. Agent: M. Graham
Sales Mgr.: A. J. Levins
MF, PS, GE, TS, TR

BARRY CONTROLS INC.
938 Pleasant St., Watertown 72, Mass. (Tel. WAtertown 3-1150)
Purch. Agent: Tom Cazmay
Buyers: Walter Wright & James Wise
V. P.-Mktg.: Edward A. Johnson
MF, PS, GE

BART MFG. CORP.
227 Main St., Belleville, N. J. (Tel. PLymouth 9-0200)
Purch. Agent: Edward Mangas
Buyer: Dorothy Durrigan
V. P.-Sales: L. P. Vollmuth
MF, WN, PS, GS, TR

BARTON INSTRUMENT CORP.
580 Monterey Pass Rd., Monterey Park, Calif. (Tel. CUmberland 3-6501)
Purch. Agent: Sylvia Clingerman
V. P.-Sales: A. I. Thompson

GEORGE BASCH CO., THE
19 Hanse Ave., Freeport, N. Y. (Tel. FReeport 8-8100)
Jerome D. Basch GS, GH

BASIC TOOL INDUSTRIES, INC.
2416 Avalon Blvd., Gardena, Calif. (Tel. DAvis 3-3213)
V. P.-Purch.: Robert F. Rigali
Exec. V. P.-Sales: Robert G. Lucas
MF, WN, PS, GS, GH

BASLER ELECTRIC CO.
R. F. D. 1, Route 143, Highland, Ill. (Tel. 2123)
Purch. Agent: Dale W. Rutz
Asst. Purch. Agent: Margaret Springs
Sales Mgr.: John D. Galligan
PS, GS, GH, GE, TS, TR

BASO INC.
730 N. Jackson St., Milwaukee 1, Wisc. (Tel. BRoadway 3-5388)
Purch. Agent: G. C. Winters
Asst. Purch. Agent: F. J. Jens
Mgr.-Relay Sales: D. Weidenfeller GE

CHRISTIE BATLAS, INDUSTRIAL SCALE MODELS
17 Irving Pl., Summit, N. J. (Tel. CR 3-8364)

★BAUSCH & LOMB OPTICAL CO.
884 St. Paul St., Rochester, N. Y. (Tel. LOcust 2-3000)
Purch. Agent: C. Buss
V. P.-Sales: A. K. Marsters
Sales Mgr.-Contract & Defense Prods.: K. E. Reynolds
MF, WN, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

MORRIS BEAN & CO.
Hyde Rd., Yellow Springs, O. (Tel. RO 7-7301)
Purch. Agent: T. E. Charlton
Asst. Purch. Agent: R. E. Pollock
V. P.-Sales: R. H. Hollister
MF, WN, PS, GS, GH

BEARIUM METALS CORP.
Mill & Commercial Sts., Rochester, N. Y. (Tel. LOcust 2-7700)
Purch. Agent: A. E. Zielke
Sales Mgr.: B. M. Garek
MF, PS, GE

BEATON & CORBIN MFG. CO., THE
328 N. Main St., Southington, Conn. (Tel. MArket 8-3636)
V. P.: C. W. Rush, Jr.
MF, PS, GS, GH, GE, TS, TR

BEATTIE-COLEMAN, INC.
1000 N. Olive St., Anaheim, Calif. (Tel. PRospect 4-4503)
Buyer: John Brewer
Purch. Clk.: T. Frish
Sales Mgr.: J. A. Wilcox
GS, CO, TS, TR

BECKMAN & WHITLEY, INC.
973 San Carlos Ave., San Carlos, Calif. (Tel. LYtell 3-7824)
Purch. Suprvsr.: Robert Rader
Purch.: Jerry Crumb
Instrument Div. Sales Mgr.: Myron B. Baldwin
Missile Prods. Div. Sales Mgr.: E. W. Place
CO, TS, TR

BECKMAN & WHITLEY, INC., MISSILE PRODUCTS DIV.
985 E. San Carlos Ave., San Carlos, Calif. (Tel. LYtell 3-7824)
Purch. Agent: J. W. Booth
Buyer-Clk.: Judy Corentt
Subcontracting: R. Fasoletos
Sales: C. R. Newman
MF, WN, PS, GS, GH, GE

BEECH AIRCRAFT CORP.
9709 E. Central, Wichita 1, Kans. (Tel. MUrray 3-4681)
Mgr.-Materials: L. E. Bowery
Asst. Mgr.-Proc.: W. R. Sullivan
Gen. Suprvsr.-Proc.: L. E. Huffman
Suprvsr.-Proc.: H. W. Deets & V. M. Melick
V. P.-Military Sales: Lynn Richardson, Washington, D. C. (Tel. DIstrict 7-3269)
V. P.-Commercial Sales: Leddy Greever, Washington, D. C.
V. P.-Export Sales: Michael G. Neuburger, Washington, D. C.

BEEDE ELECTRICAL INSTRUMENT CO. INC.
S. Main St., Penacook, N. H. (Tel. Penacook Plaza 3-6362)
Purch. Agent: William F. Wall

★BEHLMAN ENGRG. CO.
2911 Winona Ave., Burbank, Calif. (Tel. VIctoria 9-4475)
Purch. Agent: A. H. Rylands
Sales Mgr.: J. M. Schroeder
GS, GE, TR

BEHR-MANNING CO., DIV.-NORTON CO.
2758 Howe St., Troy, N. Y. (Tel. ARsenal 3-0100)
Dir.-Purch.: Byron Keene
V. P.-Sales: H. R. Merrill
MF, PS, TR

BEKINS INDUSTRIAL PACKAGING
12512 Inglewood Ave., Hawthorne, Calif. (Tel. OR 8-7213)
Gen. Mgr.: R. A. Patton
Operations Mgr.: Norman L. Johnson
Dir.-Sales & Engrg.: Noble W. Jones
GH, GS

BELDEN MFG. CO.
415 S. Kilpatrick, Chicago 44, Ill. (Tel. EStebrook 8-1000)
Dir.-Purch.: William A. Sandy
Gen. Sales Mgr.: Les A. Thayer
MF, PS, GS, GH, GE, CO, TS, TR

★BELL AIRCRAFT CORP. SPECIAL WEAPONS DIV.
P. O. Box 1, Buffalo 5, N. Y. (Tel. Niagara Falls 7851)
Dir.-Procurement: Maurice J. Coughlin
Mgr.-Materiel, Special Weapons Div.: Robert A. Folker
Mgr.-Materiel Rockets Div.: J. Bruce MacKinnon
Mgr.-Materiel, Avionics Div.: Bernard E. Wysocki
Sales: William M. Shultz
★(See advertisement in this issue)

BELL & GOSSETT CO.
8200 N. Austin, Morton Grove, Ill. (Tel. OR 3-3700)
Purch. Agent: N. Van Parys
V. P.-Sales: W. A. Boone
GS, GH, GE, TR

BELL & HOWELL CO.
7100 McCormick Rd., Chicago 45, Ill. (Tel. AMbassador 2-1600)
Purch. Mgr.: S. W. Kanbe
Buyer: Ralph Wittenmeier

BELL TELEPHONE LABORATORIES, INC.
463 West St., New York 14, N. Y. (Tel. CHelsea 3-1000)
V. P. & Gen. Mgr.: R. L. Helmreich

BELMONT SMELTING & REFINING WORKS, INC.
330 Belmont Ave., Brooklyn 7, N. Y. (Tel. DIckens 2-4900)
V. P.-Purch.: Robert V. Henning
MF, WN, PS, GE, CO, TS, TR

★BENDIX AVIATION CORP.
Executive Office: Fisher Bldg., Detroit 2, Mich. (Tel. TRinity 5-5000)
Pres.: M. P. Ferguson
★(See advertisement in this issue)

BENDIX AVIATION CORP., SKINNER-POROLOY DIV.
P. O. Box 135, Royal Oak, Mich. (Tel. JOrdan 6-2380)
Purch. Agent: David S. Kinsman
Buyer: Ivan Papin
Purch. Agent: D. S. Draves, 14943 Califa St., Van Nuys, Calif. (Tel. STate 6-2670)
PS, GS, GH

BENDIX AVIATION CORP., YORK DIV.
York, Pa. (Tel. 47-2611)
Purch. Agent: Mrs. F. B. Davis
Chief Buyer: P. B. Gross
Sales Mgr.: T. R. Bartlett
MF, WN, PS, GS, GH, GE, CO, TS, TR

CODING

Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

BENDIX COMPUTER, DIV.-BENDIX AVIATION CORP.
5630 Arbor Vitae St., Los Angeles 45, Calif. (Tel. ORchard 4-3641)
Purch. Agent: R. J. Thelen
Sr. Buyer: M. McCafferty
Buyers: G. Luttrell & R. Donovan
Dir.-Mktg.: O. P. Staderman **GE, TR**

BENDIX FOUNDRIES, BENDIX AVIATION CORP.
Teterboro, N. J. (Tel. ATlas 8-2000)
Foundry Mgr.: R. D. Ferguson
Foundry Purch. Agent: G. F. Cartier
Sales Mgr.: L. Eigenrauch **MF, PS**

BENDIX PRODUCTS DIV., BENDIX AVIATION CORP.
401 Bendix Dr., South Bend, Ind. (Tel. CEntral 3-4141)
Dir.-Purch.: C. E. Budd
Sales: C. F. Bunker
MF, WN, PS, GS, GH, GE, TS

BENDIX PRODUCTS DIV.-MISSILES, BENDIX AVIATION CORP.
400 S. Beiger St., Mishawaka, Ind. (Tel. BL 5-2111)
Dir.-Procurement: Daniel J. Youngerman
Suprvsr. Subcontract Section: Roger D. Weller
Asst. Purch. Agent: Fred R. Glassman
Contracts Mgr.: M. R. Balis

BENDIX RADIO DIV. BENDIX AVIATION CORP.
E. Joppa Rd., Baltimore 4, Md. (Tel. VAlley 3-2200)
Govt. Prods. Materials Mgr.: J. L. Winchester
Govt. Prods. Sales Mgr.: E. A. King
GH, GE, TS, TR

BENDIX RED BANK DIV., BENDIV AVIATION CORP.
Rt. 35, Eatontown, N. J. (Tel. EAtontown 3-2000)
Chief Purch. Agent: L. Fyfe
Gen. Mgr.-Sales & Serv.: N. P. Barny
PS, GS, GH, GE, TS, TR

BENSON-LEHNER CORP.
11930 W. Olympic Blvd., Los Angeles 64, Calif. (Tel. BRadshaw 2-3484)
Head-Purch.: Everett Case
Buyers: John Dudas & Richard Hill
V. P.-Appl. Engrg.: Donald B. Prell
MF, PS, GS, GH, GE, CO, TS, TR

BERGEN CARBIDE CO.
P. O. Box 531, Fair Lawn, N. J. (Tel. FAir Lawn 6-6958)
Gen. Mgr.: Charles Openden
MF, WN, PS, GS, GE, TS

BERGEN LABS.
247 Crooks Ave., Clifton, N. J. (Tel. GRegory 3-1883)
Purch. Agent: M. Hoberman
MF, GS, GE, CO, TS, TR

BERGEN WIRE ROPE CO.
11 Gregg St., Lodi, N. J. (Tel. HUbbard 7-3521)
Purch. Agent: E. Douglas
Dir.-Sales: Robert Ernst
MF, GS, GH, TS

BERKSHIRE ELECTRIC CABLE CO.
River Rd., Leeds, Mass. (Tel. Northampton-JUstice 4-3853)
Treas.: Garson R. Feinstein
MF, PS, GS, GH, CO, TS, TR

BERYLLIUM CORP., THE
P. O. Box 1462, Reading, Pa. (Tel. WAlker 9-0781)
Adv. & Sales Prom. Mgr.: Walter S. Pollard
MF, PS, GE

CHARLES BESELER CO.
219 S. 18th St., East Orange, N. J. (Tel. OR 6-6500) **GS**

BEST AIRCRAFT CORP.
67 Palisade Ave., Garfield, N. J. (Tel. PRescott 8-4463)
Purch. Agent: William Decker
Sales-Purch. Coordinator: N. V. Wetzel
Sales Mgr.: Fred Gebhardt
MF, WN, PS, GS, GH, TR

BETA ELECTRIC CORP.
Richards Ave., South Norwalk, Conn. (Tel. TEmple 8-6571)
Purch. Agent: Paul Stitzer, 333 E. 103rd St., New York, N. Y. (Tel. ENright 9-7550)
Buyer: Robert Kasnow, New York, N. Y.
Sales Mgr.: Henry Lowell **GS**

JAMES G. BIDDLE CO.
1316 Arch St., Philadelphia 7, Pa. (Tel. LO 4-1620)
Purch. Agent: Lester Markham
Chief Engr.: E. B. Curdts
Sales Mgr.: P. E. Sellers
GE, CO, TS, TR

CARL BIGGS CO.
2255 Barry Ave., Los Angeles 64, Calif.
MF, WN, PS

BIL-JAX, INC.
Archbold, O. (Tel. 2045)
Sales: R. W. Weires **GH**

★BILLINGS & SPENCER CO., THE
1 Laurel St., Hartford, Conn. (Tel. JAckson 7 5181)
Purch. Agent: Wm. V. Pilon
Sales Mgr., Spec. Forgings Div.: E. A. Crocker **MF, WN, PS, GS**
★(See advertisement in this issue)

BINKLEY MFG. CO.
Warrenton, Mo. (Tel. 48)
Purch. Agent: M. D. Coleman
Sales Mgr.-Trailer & Truck Body Div.: R. B. Meihaus
Gen. Sales Mgr.: Frank A. Bornmann

BIOS LABS., INC.
17 W. 60th St., New York 23, N. Y. (Tel. PLaza 7-8171)
Asst. Dir.-Purch.: H. Brodie
Dir.-Sales: Fred Linsker
MF, WN, PS, GS, TS, TR

RICHARD H. BIRD & CO., INC.
1 Spruce St., Waltham 54, Mass. (Tel. TWinbrook 4-0160)
Supt.: C. F. Whittemore **GE, TR**

BIRDAIR STRUCTURES, INC.
290 Larkin St., Buffalo 10, N. Y. (Tel. MOhawk 6520)
Purch. Agent: Warren K. Horey
Sales Mgr.: Alvin C. Smith

BIRNBACH RADIO CO., INC.
145 Hudson St., New York 13, N. Y. (Tel. WAlker 5-6980)
Sales Mgr.: Aaron D. Danziger
MF, WN, PS, GS, GH, GE, CO, TS, TR

J. BISHOP & CO. PLATINUM WORKS
E. King St., Malvern, Pa. (Tel. MAlvern 3100)
Dir.-Purch.: Floyd Squires
Gen. Mgr.: J. J. Buckley
Suprvsr.-Sales, Stainless Steel Prods. Div.: H. S. Roberts
Sales Mgr., Platinum Mechanical Div.: Lee Moules
Sales Mgr., Platinum Chemical Div.: David E. Lundy **MF, WN, PS, TS**

BIRTCHER CORP., THE
4371 Valley Blvd., Los Angeles 32, Calif. (Tel. CApitol 2-9101)
Purch. Agent: Jesse Matranga
Sales Mgr.: Charles F. Booher **TR**

BISHOP MFG. CORP.
10 Canfield Rd., Cedar Grove, N. J. (Tel. CEnter 9-2400)
Purch. Agent: Mrs. Alice F. Cook
Asst. Sales Mgr.: F. X. McCormack

BIWAX CORP.
3445 Howard St., Skokie, Ill. (Tel. OR 3-1050)
Sales: Dr. Paul Scrutchfield
MF, WN, PS, GE, TS, TR

BJORKSTEN RESEARCH LABS., INC.
P. O. Box 265, Madison 1, Wis. (Tel. ALpine 6-5581)
Purch. Agent: D. B. Bennett
V. P.: J. E. Henning **RE**

BLACK & DECKER MFG. CO., THE
E. Pa. Ave., Towson 4, Md. (Tel. VA 3-4400)
Purch. Mgr.: Glenn C. Wilhide, Jr.
V. P.-Chg. Sales: J. F. Spaulding
GS, GH

BLACK, SIVALLS & BRYSON, INC.
7500 E. 12th St., Kansas City 26, Mo. (Tel. BEnton 1-7200)
Adv. Dept.: A. H. Edwards **PS**

BLACKMER PUMP CO.
1809 Century Ave., S. W., Grand Rapids 9, Mich. (Tel. CHerry 1-1611)
Purch. Agent: Darcey Mahan
Dir.-Sales: E. H. Lanthorn
PS, GS, GH

BLACKSTONE CORP.
1111 Allen St., Jamestown, N. Y. (Tel. 5-1121)
Dir.-Purch.: J. P. Milham
Products Mgr.: G. A. Gustafson

BLACO MFG. CO.
6541 Euclid Ave., Cleveland 3, O. (Tel. EXpress 1-0497)
Purch.: S. J. Haretik
MF, WN, GS, GH, GE, TR

BLAND BURNER CO., THE
83 Woodbine St., Hartford 6, Conn. (Tel. CHapel 9-8651)
Purch. Agent: Jerry Glassman
Sales Mgr.: Joel Livingston
MF, WN, PS, GS

BLILEY ELECTRIC CO.
Union Station Bldg., Erie, Pa. (Tel. 22287)
GS, GE, TS, TR

E. W. BLISS CO.
1375 Raff Rd., S. W., Canton, O. (Tel. GReenwood 7-3421)
Purch. Mgr.: R. G. Lappin
Sales Mgr.: R. Y. Moss **GS**

BLISS ELECTRONIC CORP.
Box 366, Sussex, N. J. (Tel. SUssex 2-3000)
Dir.-Purch.: Gilbert Coates
GS, GH, GE, TS, TR

BLONDER-TONGUE LABS., INC.
9 Alling St., Newark 2, N. J. (Tel. MArket 2-8151)
Purch. Agent: David Rubin
Asst. Purch. Agent: John Fahey
Sales Mgr.: Joseph H. Kerner
MF, GS, GE, TS, TR

BLOOMINGDALE RUBBER CO.
Roosevelt & Grant Aves., Aberdeen, Md. (Tel. 2050)
Treas.: Philip Golbin **MF, WN**

BLOSSOM MFG. CO. INC.
292 5th Ave., New York City, N. Y. (Tel. LA 4 8044)
Dave Schoenfeld **MF, PS**

BLOWERS INC.
12655 S. Western Ave., Blue Island, Ill. (Tel. FUlton 8-3060)
Purch. Agent: S. A. Witte
MF, WN, GS, GH, CO

BODINE ELECTRIC CO.
2254 W. Ohio St., Chicago 12, Ill. (Tel. SE 3-6410)
Exec. V. P.-Purch.: E. W. Larson
Asst. Purch. Mgr.: H. G. Anderson
Sales Mgr.: W. M. Yogerst
PS, GE, TS, TR

BOEING AIRPLANE CO., PILOTLESS AIRCRAFT DIV.
Seattle, Wash. (Tel. AXminster 2121)
Mgr.-Materiel: N. W. Grigg

BOGART MFG. CORP.
315 Seigel St., Brooklyn 6, N. Y. (Tel. HY 7-4972)
Suprvsr.: H. Schoenfeld
Purch. Agents: W. Edgar & A. Levinson
Expeditor: R. Goldberg
Mgr.-Engrg. Sales: Lee N. Blatt
GE, TS, TR

BOGUE ELECTRIC MFG. CO.
52 Iowa Ave., Paterson, N. J. (Tel. LAmbert 5-2200)
Purch. Agent: Miss A. Schinman
Buyers: Edward King & J. Witcomb
Sales Mgr.: Joseph Rambusek

BOMAC LABORATORIES, INC.
Salem Rd., Beverly, Mass. (Tel. WAlker 2-6000)
Purch. Agent: William H. Gysan
Buyer-Microwave Components: Dexter W. Rundlett
Buyer-Prod. Machine Parts: George W. Pickering
Buyer-Engrg. Machine Parts: John P. White
Sales Mgr.: E. D. Benson
GE, TS, TR

BOMYTE CO., THE
Green St., Silverdale, Pa. (Tel. ALpine 7-6511)
Purch.: Louis Lignelli
Sales: Richard P. Kahn
MF, WN, GS, GE, TR

BONNY MFG. CORP.
339 Auburn St., Auburndale 66, Mass. (Tel. DEcatur 2-5796)
Treas.: R. N. Bonnett
TR

BOONTON ELECTRONICS CORP.
738 Speedwell Ave., Morris Plains, N. J. (Tel. JEfferson 9-4210)
V. P.-Purch.: J. Frucht
V. P.-Sales: J. H. Mennie
GE, CO, TS, TR

BOONTON RADIO CORP.
Intervale Rd., Boonton, N. J. (Tel. DEerfield 4-3200)
Purch. Agent: E. W. Beatty
Sales Mgr.: H. J. Lang
GS, GE, CO, TS, TR

BOOTH FELT CO. INC.
100 Water St., Brooklyn 1, N. Y. (Tel. MAin 5-3232)
Sales: R. S. Stevens
MF, PS

BOOTS AIRCRAFT NUT CORP.
Newtown Turnpike, Norwalk, Conn. (Tel. VIctor 7-2446)
Purch. Agent: Arthur T. Carlson
Sales Mgr.: Frank Lown

BORDEN CHEMICAL CO., THE, DIV.-THE BORDEN CO., RESINITE DEPT.
P. O. Box 1589, 436 E. Gutierrez St., Santa Barbara, Calif. (Tel. WOodland 3134)
Purch. Agent: James Wycherly
Purch.: H. L. Bartlett, 1 Clark St., North Andover, Mass. (Tel. MUrdock 7-7131)
Asst. Gen. Mgr.: Howard G. Smith
MF, WN, PS, GE, TS, TR

BORG EQUIPMENT DIV.-THE GEORGE W BORG CORP.
120 S. Main, Janesville, Wisc. (Tel. PLeasant 4-6616)
Sales Mgr.: R. K. Johnson
GE, TS, TR

BORG-WARNER CORP.
310 S. Michigan Ave., Chicago 4, Ill. (Tel. WA 2-7700)
Chrm.-Bd. & Chief Exec. Officer: Roy C. Ingersoll

BOSTON AUTO GAGE CO., THE
70 West St., Pittsfield, Mass. (Tel. 5691)
Purch.: C. Jacobs
Sales: T. C. Nelson
PS, GH, TS

BOSTON INSULATED WIRE & CABLE CO.
64 Bay St., Boston, Mass. (Tel. COlumbia 4-2104)
Purch. Agent: Alden Davis
Sales Mgr.: Robert Cowen
MF, PS, GH, CO, TS, TR

BOUND BROOK OIL-LESS BEARING CO.
Bound Brook, N. J. (Tel. ELliot 6-0441)
Purch. Agent: Charles Durlach
Sales Mgr.: S. S. Connor
MF, WN, PS, GH, GE

BOW SOLDER PRODUCTS CO., INC.
251 Freeman St., Brooklyn 22, N. Y. (Tel. EVergreen 9-4863)
Purch. Agent: S. Turkus, Jr.
Sales Mgr.: N. Zimmer
MF, PS, GE, TR

BOWER ROLLER BEARING DIV.
3040 Hart, Detroit 14, Mich. (Tel. VA 2-7300)
Purch. Agent: Charles Heller
Mgr.-Sales: S. E. Davidson

BOWERS BATTERY & SPARK PLUG CO.
Box 1262, Reading, Pa. (Tel. WAlker 9-0771)
Purch. Agent: Harold Deprill
Sales: Paul E. Goodrich

BOWMAR INSTRUMENT CORP.
8000 Bluffton Rd., Box 2835, Ft. Wayne, Ind. (Tel. HArrison 2351)
V. P.-Purch.: R. C. Ahlersmeyer
Gen. Sales Mgr.: George F. McCarthy, Great Neck, N. Y. (Tel. HUnter 2-1750)
PS, GS, GH, GE, CO, TS, TR

BRACKE-SEIB X-RAY CO., INC.
16 Pelham Bay Park West, Pelham Manor, N. Y. (Tel. PElham 8-4346)
Chief Engr.: William R. Muller

BRADFORD COMPONENTS, INC.
65 South Ave., Box 107, Salamanca, N. Y. (Tel. 2340)
Purch. Agent: N. Krieger
GE, TS, TR

BRADLEY LABS.
168 Columbus Ave., New Haven, Conn.
Gen. Sales Mgr.: William J. Gagnon
TS, TR

W. H. BRADY CO.
727 W. Glendale Ave., Milwaukee 9, Wisc. (Tel. ED 2-8100)
Purch. Agent: Eldon Meier
V. P.-Sales: T. W. Wise
MF, PS, GS, CO

C. S. BRAININ CO.
320 Washington St., Mt. Vernon, N. Y. (Tel. 8-5500)
Production Mgr.: G. V. Plachy
Engrg. Salesman: D. A. Calder

BRAM METALLURGICAL & CHEMICAL CO.
820 65th Ave., Philadelphia 26, Pa. (Tel. WAverly 4-2121)
Metallurgical-Chemical Mgr.: H. H. Bram
Asst.: T. G. Bram
MF, WN, PS, GS, GE, TS, TR

WILLIAM BRAND & CO., INC.
North St., Willimantic, Conn. (Tel. HArrison 3-6301)
Purch. Agent: J. R. Garey
Buyers: C. J. Crawford & P. Daly
V. P.-Sales: T. M. Sanden
MF, WN, PS, GS, GH, GE, CO, TS, TR

BRANSON INSTRUMENTS, INC.
37 Brown House Rd., Stamford, Conn. (Tel. DAvis 4-6721)
Purch. Officer: Celso Biagini
Sales: Kenneth P. Hayes
PS, GS, CO, TS

BRANSON ULTRASONIC CORP.
37 Brown House Rd., Stamford, Conn. (Tel. DAvis 4-6721)
Purch. Officer: Celso Biagini
Sales: Kenneth P. Hayes

H. BRAUN TOOL & INSTRUMENT CO. INC.
140 5th Ave., Hawthorne, N. J. (Tel. HA 7-1773)
Purch. Agent: Miss E. Clarke
Sales: E. Olmstead
MF, WN, PS, GS, GH, GE, TS, TR

RICHARD D. BREW & CO., INC.
90 Airport Rd., Concord, N. H. (Tel. CApitol 5-6606)
Purch. Agent: M. H. Tolman
Sales Mgr.: Roy E. Lonnberg
GE, CO, TS, TR

BRIDGEPORT BRASS CO.
30 Grand St., Bridgeport 2, Conn. (Tel. EDison 4-1182)
V. P. in Chg. of Proc.: Michael Schwarz
Head-Purch. Dept.: Anthony J. Malisek
V. P. in Chg. of Sales: Richard L. Allen
MF, WN, PS, GS, GE, CO, TS, TR

BRIDGWATER MACHINE CO.
2664 Gilchrist Rd., Akron 5, O. (Tel. REpublic 3-2201)
Purch. Agent: M. B. Cowling
Sales Mgr.: John W. Wolcott
MF, WN, PS, GS, GH, GE

BRIGGS ASSOCIATES, INC.
10 De Kalb St., Norristown, Pa. (Tel. BRoadway 9-0400)
Admin. Coordinator: Joseph F. Baldino

BRIGGS FILTRATION CO., THE
River Rd., Washington 16, D. C. (Tel. OLiver 4-7722)
Purch. Agent: D. H. Hardester
V. P.-Gen. Mgr.: J. H. Nash
Sales: John MacGuffin
PS, GS

BRIGHT STAR INDUSTRIES
Crooks & Getty Aves., Clifton, N. J. (Tel. GRegory 1-3200)
Purch. Agent: A. Levy
Sales Mgr.: Leon Kalkut
TS

BRIGHTON TOOL & DIE CO.
Brighton, Mich. (Tel. AC 7-4891)
Purch. Agent: R. Arnett
Gen. Mgr.: L. J. Kujawa
MF, WN, PS, GE

BRILES MFG.
1415 E. Grand Ave., El Segundo, Calif. (Tel. ORegon 8-6231)
Dir.-Purch.: Howard Wright
Purch. Agent: Bion Seaman
Gen. Sales Mgr.: Max De Zemplen
MF, WN, PS, GH

CODING

Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

BRILHART PLASTICS CORP.
Old Country Rd., Mineola, L. I., N. Y. (Tel. Pioneer 6-0425)
Purch. Agent: William Shea
Sales Mgr.: Thomas Ackerly

BRITISH ELECTRONIC SALES CO. INC.
Oakland Gardens, Flushing 64, New York, N. Y. (Tel. MU 2-5844)
Pres.: H. R. Ellis **GE, TS**

BROADCAST EQUIPMENT SPECIALTIES CORP.
Box 149, Beacon, N. Y. (Tel. 9-4587)
V. P.: David S. Gibson **TS**

★BROOK MOLDING CORP.
30 Industrial Way, Norwood, Mass. (Tel. 7-4715)
Purch. Agent: F. K. Whiting
Sales Mgr.: C. M. Cunningham
MF, PS

★(See advertisement in this issue)

BROOKLYN MFG. DIV., AMERICAN MACHINE & FOUNDRY CO.
170 53rd St., Brooklyn 32, N. Y. (Tel. HYacinth 2-3500)
Dir.-Contracts: Roger J. Kuhns
Sales Mgr.: H. J. Scudder

BROOKS ROTAMETER CO.
407 W. Vine St., Hatfield, Pa. (Tel. ULysses 5-5174)
Purch. Agent: Robert F. Gilman
Asst. Purch. Agent: John Ernst
Exec. V. P.-Sales: Seymour Blechman
GS, GH, CO, TS

BROWNING LABS., INC.
750 Main St., Winchester, Mass. (Tel. 6-3700)
Purch.: A. Costa
Sales: G. G. Greene
GE, GS, CO, TS, TR

BRUBAKER ELECTRONICS, INC., SUB.-TELECOMPUTING CORP.
3652 Eastham Dr., Culver City, Calif. (Tel. TExas 0-6441)
Dir.-Proc.: E. W. Ryan
Cust. Relations Mgr.: Ken Kaub
GS, GE, CO, TS, TR

BRUNSWICK INSTRUMENTS
Box 813, New Brunswick, N. J. (Tel. CHarter 7-5919)
Chief Engr.-Purch.: L. A. Rosenthal
Sales Mgr.: E. J. Horodner
GE, CO, TS

BRUSH BERYLLIUM CO., THE
4301 Perkins Ave., Cleveland, O. (Tel. ENdicott 1-5400)
Purch. Agent: R. A. Cobb
Asst. Purch. Agent: Robert Baker
V. P.-Sales: N. W. Bass **MF, PS**

BRUSH INSTRUMENTS, DIV.-CLEVITE CORP.
3405 Perkins Ave., Cleveland, O. (Tel. ENdicott 1-3315)
Purch. Agent: W. J. David
Gen. Sales Mgr.: Norman R. Klivans
MF, PS, GH, GE, CO, TS, TR

BRUSH NAIL EXPANSION BOLT CO.
Greenwich, Conn. (Tel. TOwnsend 9-3190)
A. H. Brush **MF, PS**

BRUST TOOL MFG. CO.
River Rd. & King St., Franklin Park, Ill. (Tel. GLadstone 5-5700)
Exec. V. P.: J. K. Carroll

BRYANT GAGE & SPINDLE DIV.
Box 620, Springfield, Vt. (Tel. TUrner 5-2141)
Prod. Control Supvsr.-Planning-Purch.: A. E. Belanger
Div. Mgr.: J. E. Smith
Chief Engr.: H. M. Taft
Sales Mgr.: P. L. Smith **GE, TR**

BUCHANAN ELECTRICAL PRODUCTS CORP.
225 Rt. 22, Hillside, N. J. (Tel. WAverly 3-7474)
Plt. Supt. & Purch. Agent: Albert Mittleman
V. P.-Chg. Sales: Paul E. Vance

★BUCKEYE IRON & BRASS WORKS
324 E. 3rd St., Dayton, O. (Tel. BAldwin 4-8355)
Purch. Agent: E. K. Griest
Asst. Purch. Agent: R. L. Reel
Sales Mgr.: Ray O. Comp
PS, GS, GH

★(See advertisement in this issue)

BUFFALO MFG. DIV., AMERICAN MACHINE & FOUNDRY CO.
Broadway & Kennedy Rd., Buffalo, N. Y. (Tel. TAylor 7800)
Sales Mgr.: H. B. Parshall
Dir.-Purch.: W. F. Bensman

BUFFALO METAL CONTAINER CORP.
35 Roetzer St., Buffalo 11, N. Y. (Tel. BA 3944)
Dir.-Purch.: Robert J. Schieder
Sales Mgr.: A. E. Bausenbach

BUHL OPTICAL CO.
1009 Beech Ave., Pittsburgh, Pa. (Tel. FAirfax 1-0076)
Purch.: M. Seder
MF, PS, GS, GE, CO, TS, TR

BULLARD CO., THE
286 Canfield Ave., Bridgeport 9, Conn. (Tel. EDison 6-2511)
Mgr.-Purch. & Traffic: T. H. Wilber
Gen. Sales Mgr.: H. E. Neale
WN, PS, GS

BULOVA WATCH CO., ELECTRONICS DIV.
40-06 62nd St., Woodside 77, N. Y. (Tel. NEwtown 9-5700)
Sales Mgr.: A. B. Ill, Jr.
GS, GE, TR

J. H. BUNNELL & CO.
81 Prospect St., Brooklyn 1, N. Y. (Tel. ULster 8-0100)
Purch. Agent: C. Siemion
Contracts Admin.: C. N. Shlenker
MF, WN, PS, GS, GE, TS, TR

BURG TOOL MFG. CO., INC.
15001 S. Figueroa St., Gardena, Calif. (Tel. FA 1-3510)
Purch. Agent: M. Tavlin
V. P.-Sales: J. Burg

BURGESS BATTERY CO.
Foot of Exchange, Freeport, Ill. (Tel. ADams 2-2161)
Purch. Agent: Raymond Beldt
V. P.-Sales: C. E. Balz **GS, GH, TS**

BURNDY CORP., OMATON DIV.
Norwalk, Conn. (Tel. TEmple 8-4711)
V. P.-Purch.: Sidney Wolberg
Purch. Agent: L. Menzl
Buyer: M. Robinson
Sales Mgr.: S. D. Bergman
MF, PS, GS, GH, GE, CO, TS, TR

BURNELL & CO., INC.
10 Pelham Pkwy., Pelham Manor, N. Y. (Tel. PElham 8-5000)
Purch. Agent: V. Triwedi
Asst. Purch. Agent: R. Levine
Sales Mgr.: L. Schwartz
GS, GE, CO, TR

BURNLEY BATTERY & MFG. CO., THE
103 Clay St., North East, Pa. (Tel. 5-3595)

BURR-BROWN RESEARCH CORP.
Box 6444, Tucson, Ariz. (Tel. AXtel 8-0772)
V. P.: Thomas R. Brown, Jr. **TS**

BURROUGHS CORP.
6071 2nd Ave., Detroit 32, Mich. (Tel. TRinity 5-2260)
Dir.-Purch.: Russ T. Stark
Defense Sales Mgr.: Jack C. Lindley
GS, GE, CO, TS, TR

BURROUGHS CORP., ELECTRONIC TUBE DIV.
P. O. Box 1226, Plainfield, N. J. (Tel. PL 6-0876)
Purch. Agent: Vincent Perrucci
Sales Dir.: Arthur B. Shesser
GS, GE, CO, TS, TR

BURTON-ROGERS CO.
42 Carleton St., Cambridge 42, Mass. (Tel. ELiot 4-1643)
Treas.: C. W. Burton

BUSSMANN MFG. DIV., McGRAW-EDISON CO.
University at Jefferson, St. Louis 7, Mo. (Tel. GArfield 1-1740)
Dir.-Purch.: Lee J. Bussmann
V. P.-Sales: J. C. Ingram
WN, GE, CO

BUTLER MFG. CO.
7400 E. 13th St., Kansas City, Mo. (Tel. BEnton 1-7400)
Dir.-Purch.: L. P. Melcher
V. P.-Mktg.: H. A. Edlund
MF, WN, PS, GS

★BYRON JACKSON PUMPS, INC., SUB.-BORG-WARNER CORP.
2301 E. Vernon Ave., Los Angeles, Calif. (Tel. LUdlow 7-6171)
Purch. Agent: Elmer C. Prairie
Mgr.-Sales: N. D. Jesse **GS, GH**

★(See advertisement in this issue)

CBS-HYTRON, DIV.-COLUMBIA BROADCASTING SYSTEM, INC.
100 Endicott St., Danvers, Mass. (Tel. SPring 4-2360)
Dir.-Purch.: Edward R. Carroll
Purch. Agent: John F. Ryan
Asst. Purch. Agents: William E. Dennis & A. S. Nelson, Jr.
Buyers: R. A. Powers, R. J. McLernon, J. W. Connery, F. W. Courage, & W. W. Cook
V. P.-Sales: John Q. Adams **TS, TR**

CDC CONTROL SERVICES, INC.
400 S. Warminster Rd., Hatboro, Pa. (Tel. OSborne 5-4100)
Head, Purch. Dept.: Alfred Krieg
V. P.-Sales: J. Lawrence Tecosky
MF, WN, PS, GS, GH, GE, CO, TS, TR

CELCO (CONSTANTINE ENGRG. LABORATORIES CO.)
P. O. Box 555, Mahwah, N. J. (Tel. DAvis 7-1123)
Purch. Agent: Angeline Constantine
Gen. Mgr.: Pano Constantine
MF, PS, GS, GE, TS, TR

CESCO
4025 Sebastopol Hwy., Santa Rosa, Calif. (Tel. LIberty 2-0160)
Pres. & Gen. Mgr.: D. E. Stem
GS, GE

CGS LABS., INC.
Rts. 7 & 35, Ridgefield, Conn. (Tel. ID 8-2317)
Head-Materials Control: Mrs. Nellie Holowienko, 391 Ludlow St., Stamford, Conn. (Tel. DA 5-1581)
Head-Engrg. Purch.: John A. McGeorge, Stamford
V. P.-Mktg.: Melvin L. Jackson
GE, TS, TR

SAMUEL CABOT INC.
141 Milk St., Boston, Mass. (Tel. HAncock 6-1010)
Plant Supt.: Augustus H. Hermann
Sales Mgr.: Samuel Cabot, Jr.

CADDELL-BURNS MFG. CO. INC.
40 E. 2nd St., Mineola, N. Y. (Tel. PIoneer 6-2310)
Purch.-Sales: Ralph Caddell & Sidney V. Burns GS, GE, TS, TR

CADILLAC GAGE CO.
Box 3806, Detroit 5, Mich. (Tel. PRescott 7-7100)
Purch. Agent: George Boothroyd
Sales Mgr.: Robert Kolp
MF, WN, PS, GS, GE, CO, TS

CAIG LABS.
46 Stanwood Rd., New Hyde Park, L. I., N. Y. (Tel. PIoneer 2-0278)
Purch.: A. Pagelson
Sales: O. Lohkemper GS, GH

CAL-AIR CONDITIONING CO.
3930 N. Mission Rd., Los Angeles 31, Calif. (Tel. CApitol 5-5694)
Purch.: C. Marculescu
Sales Mgr.: L. W. Marbourg GS, GH

CALCON MFG. CO., INC.
100 Oakland Ave., Washington, Pa. (Tel. BAldwin 2-8190)
Wks. Mgr.-Purch.: A. W. Moore
Gen. Sales Mgr.: James C. Morosco
TR

CALFIBE CO., INC.
Colton & Wabash Ave., Mentone, Calif.
Mailing Add.: P. O. Box 832, Redlands, Calif. (Tel. PY 4-8425)
V.P.-Purch.: William M. Jordan
Purch.: Paul Bowler
Sales: Don F. Maier, 6214 W. Manchester Ave., Los Angeles 45, Calif. (Tel. OR 8-6890) MF, WN, PS, GE

CALCOR CORP., AIRCRAFT DIV.
1010 W. Philadelphia St., Whittier, Calif. (Tel. CApitol 1-1131)
Dir.-Purch.: Eddie Loos, Jr.
Buyers: George F. Beaty & Richard Shifflet
Sales Mgr.: J. Horacek, Jr.
MF, WN, PS, GS, GH, GE, CO, TS, TR

CALIFORNIA AIRCRAFT PRODUCTS
790 Greenfield Dr., El Cajon, Calif. (Tel. HIckory 2-3451)
Purch. Agent: Gavin W. Coles
Buyer: Ernest W. Brown
Sales Mgr.: Joseph S. Alan MF, PS

CAMBRIDGE INSTRUMENT CO., INC.
3811 Grand Central Terminal, New York 17, N. Y. (Tel. MUrray Hill 6-0335)
Purch.: R. A. Packard GE, CO, TS, TR

★CAMERON IRON WORKS, INC.
P. O. Box 1212, Houston, Texas
V. P. & Gen. Mgr.: Herbert Allen
Mgr.-Special Prod. Dept.: J. W. Brougher MF, WN, PS
★(See advertisement in this issue)

CALIDYNE CO., INC., THE
120 Cross St., Winchester, Mass. (Tel. WI 6-3810)
Purch. Agent: G. Worthen
Sales Mgr.: D. L. Wrisley TS

CALIFORNIA COMPUTER PRODUCTS
3927 W. Jefferson Blvd., Los Angeles 16, Calif. (Tel. RE 5-8355)
Purch.: Robert C. Morton GS, TS

CALIFORNIA TECHNICAL INDUSTRIES, DIV.-TEXTRON INC.
1421 Old County Rd., Belmont, Calif. (Tel. LYtell 3-8466)
Purch. Agent: John Woodside
Sales Mgr.: E. J. Bradley
GS, GH, GE, CO, TS, TR

CALLERY CHEMICAL CO.
9600 Perry Hwy., Pittsburgh 37, Pa. (Tel. FOrest 4-1130)
Purch. & Traffic Mgr.: L. O'Hearn
Sr. Buyer: H. W. McDanel
Purch. Agent: B. A. Mueller
Mgr.-Mktg. Div.: R. A. Mulholland
PS, GS, GH

CAL-OHM LABS., INC.
P. O. Box 2989, 3110 Goddard Way, San Diego 12, Calif. (Tel. CYpress 5-0606)
Purch. Agent & Sales: W. F. Conrad
Buyer: L. G. Guido
MF, PS, GS, GE, TS, TR

CAMBRIDGE WIRE CLOTH CO., THE
Cambridge, Md. (Tel. CAmbridge 1033)
Purch. Agent: Fulton Moore
MF, PS, GS, GH

CAMDALE CORP.
28300 Groesbeck Hwy., Roseville, Mich. (Tel. PRescott 1-0400)
Purch. Agent: H. L. Miller
V. P.-Sales: J. L. Hanifen GS

CAMERAFLEX CORP.
1947 Broadway, New York 23, N. Y. (Tel. TRafalgar 3-4022)
V. P. & Gen. Mgr.: George H. Kauffeld, Jr.
Chief Engr.: Joseph Henkel
Prod. Mgr.: Frank LaSalla
GS, GH, GE, TS, TR

CAMLOC FASTENER CORP.
22 Spring Valley Rd., Paramus, N. J. (Tel. HUbbard 9-4900)
Gen. Supt.: T. A. Barkauskas
Purch. Agent: U. G. Grapengeter
Purch. Dept.: T. Skelly
Eastern Sales Mgr.: Wm. E. Bracey
Western Sales Mgr.: James G. English, 5410 Wilshire Blvd., Los Angeles, Calif. (Tel. WEbster 1-1361) MF, PS

CANADIAN RADIUM & URANIUM CORP.
630 Fifth Ave., New York 20, N. Y. (Tel. CIrcle 6-0460)
Purch.: Carl Krieger
Sales Mgr.: Henry B. Kearney
MF, WN, PS, GE, CO, TS, TR

CANNON ELECTRIC CO.
3208 Humboldt St., Los Angeles 31, Calif. (Tel. CApitol 5-1251)
Mgr.: Roy Whitney
Purch. Agent: Earl Bixler
Sales Mgr.: Alden Olsen
PS, GS, GH, GE, CO, TS, TR

CANOGA CORP. OF CALIFORNIA
5955 Sepulveda Blvd., P. O. Box 550, Van Nuys, Calif. (Tel. STate 6-9010)
Dir.-Purch.: Louis E. Moore
Sr. Buyer: Warren W. Flee
Buyer: William E. Weible
V. P.-Sales: S. H. Mibbe
WN, GS, GE, TS, TR

CAPEWELL MFG. CO.
60 Governor St., Hartford 2, Conn. (Tel. JAckson 2-8191)
V. P.: Seery C. Gordon
MF, WN, PS, GS, GH, TS, TR

CAPITOL MACHINE CO., THE
36 Balmforth Ave., Danbury, Conn. (Tel. PIoneer 3-2758)
Purch. Agent & Sales Mgr.: Arthur E. Wilson GE, TR

CARAD CORP.
2850 Bay Rd., Redwood City, Calif. (Tel. EM 8-2969)
Chief Engr. for Materiel Evaluation: L. L. Libby
Resins Buyer: P. D. Detring
Buyer: D. Y. Yetter
Sales: G. E. Glatthar GS, GE, TS, TR

CARBONE CORP., THE
Boonton, N. J. (Tel. DE 4-0700)
Purch. Agent: K. Olsen
Asst. Purch. Agent: F. Steigman
Sales Mgr.: E. G. Dixon
MF, WN, PS, GS, GH, GE, TS, TR

CARBORUNDUM METALS CO., THE
P. O. Box 32, Akron, N. Y. (Tel. 9454)
Purch. Agent: William F. Pritchard
Mgr., Sales Dev. Branch: H. A. Andersen

CARDINAL INSTRUMENTATION CORP.
4201 Redwood Ave., Los Angeles 66, Calif. (Tel. EXmont 1-5201)
Purch. Agent: Galen Skutt
Purch.: Mary Ann Shoemaker
Sales Mgr.: Sherman Lebo
PS, GS, GE, CO, TS, TR

CARDOX CORP.
307 N. Michigan Ave., Chicago 1, Ill. (Tel. RAndolph 6-5353)
Purch. Agent: M. Hemman
Proj. Mgr.-High Press. Pneumatics: R. J. Bailey
V. P.-Sales: F. C. Rodgers
PS, GS, GH, TS

CARLETON AVIATION CO., INC.
Seneca St., East Aurora, N. Y. (Tel. CYpress 4838)
Purch.: George R. Ord
PS, GS, GH, GE

CARLING ELECTRIC, INC.
400 New Park Ave., West Hartford 10, Conn. (Tel. ADams 2-4461)
Purch. Agent: William Fleming
Dir.-Sales: Wesley T. Sorenson
GE, TR

CARMODY CORP.
2360 Wehrle Dr., Buffalo 21, N. Y. (Tel. SPring 7700)
Purch. Agent: R. E. Pollock
Dir.-Tng.: W. A. Lybrand

CARPENTER STEEL CO., THE
Front & Bern Sts., Reading, Pa. (Tel. FR 4-8211)
Purch. Agent: R. P. Freehafer
Asst. Purch. Agent: G. D. Nahm
V. P.-Sales: H. S. Potter
MF, WN, PS

CARPENTER STEEL CO., THE ALLOY TUBE DIV.
Springfield Rd., Union, N. J. (Tel. MUrdock 6-7230)
Purch. Agent: V. T. Nolan
Asst. Purch. Agent: R. A. Southard
Mgr.-Sales: W. R. Staples MF, PS

CARRIER CORP.
Carrier Pkwy., Syracuse, N. Y. (Tel. HOward 3-8411) MF, PS

CARROLL PRESSED METAL, INC.
133 Dewey St., Worcester 10, Mass. (Tel. SWift 9-4116)
V. P.-Treas.: Irving J. Donahue, Jr.
MF, WN, PS, GE

CARTER CONTROLS, INC.
2800 Bernice Rd., Lansing, Ill. (Tel. GR 4-3305)
Purch. Agent: J. C. Miller
Head-Sales: H. H. Davis PS, GS

J. C. CARTER CO., THE
671 W. 17th St., Costa Mesa, Calif. (Tel. LIberty 8-3421)
Purch. Agent: William C. Melo
V. P.-Mfg.: C. J. Allan
V. P.-Engrg. & Sales: M. D. Kilmer

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

CARTER MOTOR CO.
2711 W. George St., Chicago 18, Ill. (Tel. JUniper 8-7700)
Purch.: A. J. Carter
Sales Mgr.: E. J. Mitchell PS, GE

A. W. CASH CO.
P. O. Box 551, Decatur Ill. (Tel. 8-3401)
Purch. Agent: S. T. Clark
Sales: H. M. Kirkby PS, GS, GH

CATALIN CORP. OF AMERICA
1 Park Ave., New York 16, N. Y. (Tel. MUrray Hill 3-2100)
Adv. Mgr.: R. A. Woodard MF

ALBERT H. CAYNE EQUIPMENT CORP.
71 Spring St., New York 12, N. Y. (Tel. CAnal 6-3317)
Purch. Agent: J. C. Lynn
Dir.-Sales: Albert H. Cayne GS

CAYWOOD-SCHILLER, ASSOCIATES
203 N. Wabash Ave., Chicago 1, Ill. (Tel. ANdover 3-3340)
Purch.: T. E. Caywood
Purch. & Sales: D. H. Schiller

CEDAR ENGRG. DIV.-CONTROL DATA CORP.
5806 W. 36th St., Minneapolis 16, Minn. (Tel. WEst 9-7858)
Purch. Agent: Louis G. Bernier
Chief Engr.: Tom Kamp
Sr. Staff Engr.: J. G. Schaberg
Dir.-Engrg. Sales: C. W. North
PS, GS, GE, CO, TR

CENTRAL COIL CO. INC.
1720 N. Luett St., Indianapolis, Ind. (Tel. MElrose 2-6344)
Purch. Agent & Sales Dir.: J. C. Keith
Buyer: C. Godan GE, CO, TS, TR

CENTRAL ELECTRONICS MFGRS., INC.
2 Richwood Place, Denville, N. J. (Tel. ROckaway 9-4200)
Purch. Agent: M. Buff
Sales Mgr.: Gene G. Perry
GE, TS, TR

CENTRAL RESEARCH LABORATORIES, INC.
Red Wing, Minn. (Tel. DU 8-3566)
V. P.: Demetrius G. Jelatis PS

CENTRAL TRANSFORMER CO.
900 W. Jackson Blvd., Chicago 7, Ill. (Tel. TAylor 9-1936)
Purch. Agent: Miss Katharine Bednar
Sales Mgr.: Frank J. Gallagher
PS, GS, GE, TS, TR

CENTRONIX INC.
34 Oleander St., Cocoa, Fla. (Tel. 2040)
Purch. Mgr.: Clint Williams, Jr.
Sr. Buyer: G. H. Williams
Sales Mgr.: H. Carlisle Dent
GS, GH, CO, TS, TR

CENTURY ELECTRONICS & INSTRUMENTS, INC.
1333 N. Utica, Tulsa, Okla. (Tel. LUther 4-7111)
Purch. Agent: C. R. Campbell
V. P.-Sales: T. J. Ray, Jr. TS, TR

CENTURY FASTENERS CORP.
88 Sandford St., Brooklyn 5, N. Y. (Tel. ULster 2-6440)
Mgr., Aircraft Div.-Purch.: Pierre Tord
Sales Mgr.: George Stieglitz
MF, WN, PS, GS, GH, GE, TR

CERAMASEAL, INC.
P. O. Box 25, New Lebanon Ctr., N. Y. (Tel. West Lebanon 3-5851)
Chief Engr.-Purch.: Gustar Lind
Mgr.-Sales Engrg.: Gene D. Sawin
MF, PS, GE

CERAMET CORP.
475 W. 216th St., New York 34, N. Y. (Tel. WIlliams 2-2525)
Sales Mgr.: J. R. Strauch GE

CHADWICK-HELMUTH CO.
472 E. Duarte Rd., Monrovia, Calif. (Tel. EL 8-4567)
Sales: James R. Chadwick GE, TS, TR

CHAIN BELT CO.
4701 W. Greenfield Ave., Milwaukee, Wisc. (Tel. EVergreen 4-3000)
V. P.-Purch.: F. G. Syburg
Asst. Dir.-Purch.: F. A. Coenen
Purch. Agent: C. B. Johnson
Asst. Purch. Agents: M. O. Menzel & T. R. Seymour
V. P.-Mktg.: G. H. Woodland
MF, PS, GS, GH, GE

★CHAIN BELT CO., SHAFER BEARING DIV.
Belmont Rd. at Curtiss St., Downers Grove, Ill. (Tel. WOodland 9-1770)
Div. Purch. Mgr.: J. J. Friedrich
Asst. Sales Mgr.: R. Schramm
★(See advertisement in this issue)

CHALCO ENGRG. CORP.
15126 S. Broadway, Gardena, Calif. (Tel. FAculty 1-0121)
Purch. Agent: Irving Kierman
Secy.-Buyer: Hilda Garcia
Dir.-Sales: William Rose

CHALLENGE MACHINERY CO., THE
First St., Grand Haven, Mich. (Tel. 2800)
Purch. Agent: James Harvey
Plant Mgr.: Arthur Nelson
Sales Mgr.: Paul Babcock

CHAMPION AIRCRAFT CORP.
Municipal Airport, Osceola, Wis. (Tel. STate 4-2141)
Comptroller: Anthony Bour
Prod. Control: Donald Jensen

CHAMPION AIRQUIPMENT INC.
Box 8786, Pittsburgh 21, Pa. (Tel. EXport 360)
Purch. Agent: J. J. Konoski, Jr.
Mgr.-Sales: H. B. Middendorf
MF, WN, PS, GS, GH, CO, TS, TR

CHAMPION CO., THE
400 Harrison St., Springfield, O. (Tel. FAirfax 3-7545)
Purch. Agent: W. E. Cooksey
Mgr.: Joe C. Mills
Mgr.-Sales: Norman L. Dickey
MF, PS, GS, GH, TS

CHANCE VOUGHT AIRCRAFT, INC.
P. O. Box 5907, 9314 W. Jefferson St., Dallas, Texas (Tel. AN 2-3211)
Gen. Purch. Agent: B. A. Carlson
V. P.-Sales & Service: W. P. Thayer
Purch. Agent, Equipment & Systems Section: J. R. Bruno
Purch. Agent, Gen. Purch.: A. J. Patton
Purch. Agent, Subcontracting: W. H. Haugh

CHANDLER-EVANS, DIV.-PRATT & WHITNEY CO., INC.
Charter Oak Blvd., West Hartford 1, Conn. (Tel. ADams 3-7561)
Purch. Agent: G. K. Metcalfe
Sales Mgr.: Louis G. Burns
PS, GS, GH

CHART-PAK, INC.
River Rd., Leeds, Mass. (Tel. JUstice 4-5446)
V. P.-Prod.: Howard N. Gold
Asst. Purch.: Ernie LaBarge
Sales Mgr.: John L. Milanese
MF, PS, GS, TR

CHASE BRASS & COPPER CO., INC.
236 Grand St., Waterbury 20, Conn. (Tel. PLaza 6-9444)
Purch. Agent: C. D. Patterson
Gen. Sales Mgr.: W. E. Evans
MF, WN, PS, GE, TS, TR

CHASSIS-TRAK, INC.
525 S. Webster Ave., Indianapolis, Ind. (Tel. FLeetwood 9-5407)
Gen. Mgr.: Martin R. Christman
Purch. Agent: J. Maurice Harrell

CHEMALLOY ELECTRONICS CORP.
Gillespie Airport, Santee, Calif. (Tel. San Diego—HIckory 4-7661)
Gen. Mgr.: Samuel Freedman
MF, GE, CO, TS, TR

CHEMICAL CONTOUR CORP.
12049 Regentview, Downey Calif. (Tel. TOpaz 1-0331)
Purch. Agent: J. H. Mills
Mgr.-Cust. Relations: Thomas E. Davidson
MF

CHEM-X, INC.
6920 S. Stanford Ave., Los Angeles 1, Calif. (Tel. PLeasant 2-6161)
Pres.: Ralph M. Cahill

CHESAPEAKE INSTRUMENT CORP.
Shadyside, Md. (Tel. UNiversity 7-2151)
Purch. Agent: W. Mangis
Purch. Mgr.: W. L. Cipperly

CHESTER CABLE CORP.
2000 Hill St., Chester, N. Y. (Tel. HOmestead 9-2141)
Gen. Purch. Agent: J. A. Henderson
MF, PS, GS, GH, CO, TS, TR

CHICAGO AERIAL INDUSTRIES, INC.
1980 Hawthorne Ave., Melrose Park, Calif. (Tel. FIlmore 5-1840)
Purch. Agent: H. S. Kays
Dir.-Cust. Rel.: Donald P. Frankel
GS, GE, CO, TS, TR

CHICAGO-ALLIS MFG. CORP.
113-125 N. Green St., Chicago 7, Ill. (Tel. MOnroe 6-5050)
Dir.-Purch.: C. S. Immig
Buyer: W. J. Kelly
Gen. Sales Mgr.: D. H. Ball
MF, WN, PS, GS

CHICAGO DIV., AMERICAN BOSCH ARMA CORP.
5857 W. 95th St., Oak Lawn, Ill. (Tel. PRescott 9-7220)
Purch. Agent: Gene Flood
Mgr.-Contracts & Sales: A. M. Bozich
GS, GE, CO, TS, TR

CHICAGO ELECTRONIC ENGRG. CO., INC.
3223 W. Armitage Ave., Chicago 47, Ill. (Tel. CApitol 7-3130)
Purch. Agent: H. Davidson
PS, GS, GE, TS, TR

CHICAGO GASKET CO.
1271 W. North Ave., Chicago 39, Ill. (Tel. HUmbolt 6-3060)
V. P.: R. H. Martin

CHICAGO MINIATURE LAMP WORKS
1500 N. Ogden Ave., Chicago 10, Ill. (Tel MOhawk 4-1741)
Purch.: T. Singer
Sales: E. E. Freeman, Jr.
GS, CO, TS, TR

CHICAGO MOLDED PRODUCTS CORP.
1020 N. Kolmar Ave., Chicago 51, Ill. (Tel. DIckens 2-9000)
Purch. Agent: Frank E. Klingenmeier
Asst. Purch. Agent: Cuyler Stanek
V. P.-Chg. Molding Div.-Sales: James E. Johnston MF

CHICAGO PNEUMATIC TOOL CO.
6 E. 44th St., New York 17, N. Y. (Tel.

MUrray Hill 7-1700)
Purch. Mgr.: K. T. Dolson
Electric Div. Mgr.: L. J. Walker
WN, PS, GS, GH, GE, TS, TR

CHICAGO RIVET & MACHINE CO.
950 S. 25th Ave., Bellwood, Ill. (Tel. LInden 4-5100)
Dir.-Purch.: Walter Bautz
Sales Mgr.: Wm. O. Shineflug

CHICAGO SCREW CO., THE, DIV.-STANDARD SCREW CO.
2501 Washington Blvd., Bellwood, Ill. (Tel. LInden 4-3500)
Dir.-Purch.: W. J. McCoy
Asst. Purch. Agents: P. W. McKenna & W. A. Denk
V. P.-Standard Prod. Sales: E. L. Claussen
MF, WN, PS

CHICAGO STANDARD TRANSFORMER CORP.
3501 W. Addison St., Chicago, Ill. (Tel. INdependence 3-7400)
Purch.: E. Donnellan
V. P. & Plt. Mgr.: R. Gislason
GS, GE, TS, TR

CHICAGO TELEPHONE SUPPLY CORP.
1142-1232 W. Beardsley Ave., Elkhart, Ind. (Tel. 3-0310)
Purch. Agent: Frank A. Bundy
Sales Mgr.: Henry E. Sanders
GE, TS, TR

CHIKSAN CO.
330 N. Pomona Ave., Brea, Calif. (Tel. JAsper 9-2121)
Mgr.-Purch.: E. H. Nelson
Sales Mgr.: L. J. Smith PS, GS, GH

CHISHOLM-MOORE HOIST DIV., COLUMBUS McKINNON CHAIN CORP.
Fremont Ave., Tonawanda, N. Y. (Tel. JAckson 2230)
Purch. Agent: W. Wolf
Product Mgr.: E. J. Byrne

C. B. CHRISTIANSEN CO.
164 Pennington St., Newark 5, N. J. (Tel. MArket 3-4979)
Purch. Agent: L. Tarzinski
Sales: B. W. Deehan
MF, WN, PS, GS, GH, TS, TR

CHRISTIE ELECTRIC CORP.
3410 W. 67th St., Los Angeles 43, Calif. (Tel. PLeasant 3-2607)
Purch. Agent: H. B. Doty
Sales Mgr.: E. E. Hughes
GS, GH, GE, TS

CHRISTIE MACHINE WORKS
201 Harrison St., San Francisco 5, Calif. (Tel. EXbrook 2-2187)
V. P.: Lloyd F. Christie
Sales Mgr.: Lloyd M. Christie PS, TR

CHRYSLER CORP., DEFENSE OPERATIONS DIV.
P. O. Box 1687, Detroit 31, Mich.
Purch. Agent: S. J. Roach
Mgr., Buying & Follow-up: J. P. Forbes
Mgr., Purch. Analysis: C. R. McMacken
Subcontracts Negotiation: P. J. Paonessa

CINCINNATI MILLING MACHINE CO., THE
Marburg Ave., Cincinnati 9, Ohio (Tel. REdwood 1-2121)
Purch. Agent: Herman Decatur

CINCINNATI SUB ZERO PRODUCTS
3932 Reading Rd., Cincinnati 29, O. (Tel. PLaza 1-8810)
Purch. Agent: H. Kaupf
Proj. Engr.: R. E. Schroeder
Chief Engr.-Sales: T. J. Frederick
GS, TS

CIRCON COMPONENT CORP.
Santa Barbara Municipal Airport, Goleta, Calif. (Tel. WOodland 7-1113)
Sales Mgr.: M. J. Ainsworth
MF, WN, PS, GS, GH, GE, TS, TR

C. P. CLARE & CO.
3101 Pratt Blvd., Chicago 45, Ill. (Tel. AMbassador 2-7700)
Purch. Agent: B. E. Brooks
V. P. in Chg. of Sales: D. R. Dooley
GE

CLARK CRYSTAL CO.
2 Farm Rd., Marlboro, Mass. (Tel. 1411)
Mgr.: F. L. Nobles GS, GE

CLARK ELECTRONIC LABORATORIES
Box 165, Palm Springs, Calif. (Tel. FA 8-2210)
Purch. Agent: H. L. Spencer
Dir.-Sales: D. B. Clark
PS, GE, CO, TR

CLARK EQUIPMENT CO.
24th St., Battle Creek, Mich. (Tel. WO 2-6561)
Purch. Agent: J. G. Swanson
MF, WN, PS, GS, GH

CLARK-AIKEN CO., THE
Water St., Lee, Mass. (Tel. 700)
Prod. Engr.: J. P. Stoeke
MF, PS, GS, GH

CLAROSTAT MFG. CO., INC.
Dover, N. H. (Tel. SHerwood 2-1120)
Purch. Dir.: E. O. Schramm
V. P.-Sales: I. J. Youngblood
GE, TS, TR

CLARY DYNAMICS
408 Junipero St., San Gabriel, Calif. (Tel. ATlantic 7-6111)
Purch. Agent: Don Werdter
Gen. Sales Mgr.: Charles T. Cosser
MF, WN, PS, GS, GH, GE

CLAUSING DIV.-ATLAS PRESS CO.
1915 N. Pitcher St., Kalamazoo, Mich. (Tel. FIreside 5-7157)
Head-Purch.: S. L. Shaw
Buyer: L. J. Feltes
Head-Sales: G. C. Nancarrow
MF, WN, PS, GS

CLEMCO AERO PRODUCTS, INC.
210 E. Manville St., Compton, Calif. (Tel. NEvada 6-8162)
Purch. Agent: C. E. Bowie
Contract Admin.: R. H. Farney
MF, WN, PS, GS, GE, TS

CLEVELAND CRANE & ENGRG. CO., THE
Wickliffe, O. (Tel. WHitney 3-3700)
Purch. Agent: G. W. Urban GS

CLEVELAND GRAPHITE BRONZE CO., DIV.-CLEVITE CORP.
17000 St. Clair Ave., Cleveland 10, O. (Tel. IVanhoe 1-7221)
Dir.-Purch.: J. G. Mehring
Purch. Agent: J. C. Hall
Asst. Purch. Agent: P. W. Love
Purch. Analyst: J. Hopkins
V. P.-Sales: L. W. Christenson
MF, WN, PS, GS, GH, GE, TR

CLEVELAND INSTRUMENT CO.
735 Carnegie Ave., Cleveland 15, O. (Tel. PRospect 1-7070)
Purch. Agent: W. Young
Mgr.-Sales: F. W. Witzke
MF, WN, PS, GE, CO, TS, TR

CLEVELAND METAL SPECIALTIES CO.
1783 E. 21st St., Cleveland 14, O. (Tel. PRospect 1-4186)
V. P.-Purch.: Joe Japel
Chief Engr.-Sales: Al Gross
MF, WN, PS, GS, GE, TR

CLEVELAND PNEUMATIC TOOL CO., THE, DIV.-CLEVELAND PNEUMATIC INDUSTRIES, INC.
3781 E. 77th St., Cleveland 5, Ohio (Tel. DIamond 1-1700)
Purch. Agent: A. L. Rafter
Operations Supvr.: Melvin Kail
V. P.-Sales: E. W. Krueger

CLEVELAND WELDING CO., AMERICAN MACHINE & FOUNDRY CO.
W. 117th St. & Berea Rd., Cleveland 11, Ohio (Tel. WOodbine 1-2820)
Gen. Sales Mgr.: F. L. Nemeth
Purch. Agent: A. A. Mitsch

CLEVITE TRANSISTOR PRODUCTS, DIV.-CLEVITE CORP.
241-257 Crescent St., Waltham 54, Mass. (Tel TWinbrook 4-9330)
Dir.-Purch. & Prod. Control: W. T. Howland
Purch. Agent: G. Hird
Sr. Buyer: T. Kenney GE, TS, TR

CLIFTON PRECISION PRODUCTS CO., INC.
Marple at Broadway, Clifton Heights, Pa. (Tel. MAdison 6-2101)
Purch. Agent: Tyson Parker
V. P.-Sales: Thomas W. Shoop
GE, TS, TR

CLOVER INDUSTRIES, INC.
588 Young St., Tonawanda, N. Y. (Tel. LUdlow 1331)
V. P.-Purch.: H. Paul Henderson MF, PS

COAST MFG. & SUPPLY CO.
Box 71, Livermore, Calif. (Tel. HIlltop 7-1000)
Purch. Agent: A. J. Andersen MF, PS

COAXIAL CONNECTOR CO. INC.
37 N. 2nd Ave., Mt. Vernon, N. Y. (Tel. MOunt Vernon 8-6416)
Purch. Agent: William R. Clayton
MF, PS, GS, GH, GE, CO, TR

COBEHN, INC.
226 Passaic Ave., Caldwell, N. J. (Tel. 6-6675)
Purch. Agent: William E. Bellars

COFFING HOIST DIV., DUFF-NORTON CO.
800 Walter St., Danville, Ill. (Tel. 6-3800)
Product Mgr.: A. M. Kelly

COHAN EPNER CO. INC.
142 W. 14th St., New York 11, N. Y. (Tel. CHelsea 3-3411)
Purch. Agent: William Epner
V. P.-Sales: Gerald Epner
MF, WN, PS, GS

COIL CO. OF AMERICA
215 Washington St., Northvale, N. J. (Tel. CLoster 5-3434)
Purch.: E. Legacy GS, GE, TS, TR

COIL WINDING EQUIPMENT CO.
Oyster Bay, N. Y. (Tel. OY 6-1285)
Purch. Agent: Mrs. Blanche A. George
Sales: Howard A. George GS, GH

COLE-HERSEE CO.
20 Old Colony Ave., South Boston 27, Mass. (Tel. ANdrew 8-2190)
Dir.-Purch.: G. B. Jacobs
Asst. Purch. Agent: J. J. Santisi, Jr.
Gen. Sales Mgr.: L. Mayer PS, GE, TR

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

COLEMAN ENGRG. CO., INC.
3500 Torrance Blvd., Torrance, Calif. (Tel. FAcilty 1-3900)
Purch. Agent: E. J. Hannaman
Buyers: Robert Williams & Reg Bliss
Dir.-Cust. Relations: J. U. Thomson
PS, GS, GE, TS, TR

COLES CRANES, INC.
P. O. Box 942, Joliet, Ill. (Tel. 6-4261)
Purch. Agent: L. J. Blessing **GS**

COLLINS ENGRG. CORP.
9050 Washington Blvd., Culver City, Calif. (Tel. TExas 0-4811)
Chief Purch. Agent: Ada Kadinger
Buyer: Eloise Smith
Sales: John J. Collins
MF, PS, GS, GE

G. L. COLLINS CORP.
2820 E. Hullett St., Long Beach 5, Calif. (Tel. MEtcalf 0-3121)
V. P.-Purch.: Glenn D. Collins
Admin. Engr.: Sam L. Collins **GE, TS, TR**

COLLINS RADIO CO.
855 35th St., N. E., Cedar Rapids, Iowa (Tel. EMpire 3-0281)
Purch. Dir.: John H. Wagner
V. P.-Sales: J. G. Flynn, Jr., Dallas, Tex. (Tel. RIverside 7-5151)
WN, GS, GE, TR

COLUMBIA ELECTRIC MFG. CO.
4519 Hamilton Ave., Cleveland 14, O. (Tel. ENdicott 1-8060)
Purch. Agent: John Sygielski
Sales Mgr.: H. W. Sussman **GS, TS**

COLUMBIA RESEARCH LABS.
MacDade Blvd. & Bullens Lane, Woodlyn, Pa. (Tel. CHester 2-0381)
Buyer: Victor F. Alibert
Asst. Buyer: Thomas Carey, Jr.
Sales Mgr.: Vernon F. Alibert
MF, PS, GS, GH, GE, CO, TS, TR

COLUMBIA ROPE CO.
309 Genesee St., Auburn, N. Y. (Tel. 3-3221)
Purch. Agent: C. A. Fowler
V. P.-Sales: L. R. Hole **MF, GS**

COLUMBIAN CARBON CO., MAPICO COLOR UNIT
380 Madison Ave., New York 17, N. Y. (Tel. MUrray Hill 7-2300)
Sales Mgr.: E. B. Brooks **MF, PS**

COLUMBUS BOLT & FORGING CO.
291 Marconi Blvd., Columbus, O. (Tel. CApitol 4-2271)
Dir.-Sales: Jack Hindes
MF, WN, PS

COMAR ELECTRIC CO.
3349 Addison St., Chicago 18, Ill. (Tel. JUniper 8-2410)
Purch. Agent: Richard Baer
Asst. to Purch. Agent: A. Koch
Sales Mgr.: L. E. Noelck
GS, GE, TR

COMMERCIAL FILTERS CORP.
2 Main St., Melrose, Mass. (Tel. MAlden 4-7000)
Purch. Agent: Alan Riley
Sales Mgr.: James Chisholm **PS, GS**

★COMMERCIAL SHEARING & STAMPING CO.
1775 Logan Ave., Youngstown, Ohio (Tel. RI 6-8011)
Purch. Agent: D. A. Bood
MF, WN, PS, GS
★(See advertisement in this issue)

COMMONWEALTH FELT CO.
76 Summer St., Boston 10, Mass. (Tel. LIberty 2-6590)
Treas.: I. Goldberg
Mgr.-Cut Parts Div.: N. M. Benson
Sales: J. S. Patterson **MF, PS**

COMMUNICATIONS CO.
300 Greco Ave., Coral Gables, Fla. (Tel. HI 6-0846)
Purch. Agent: W. K. Whitmire
Asst. Gen. Mgr.-Sales: F. R. Macklin
GS, GH, GE, TR

COMMUNICATIONS RESEARCH CO.
P. O. Box 778, Main Station, Richmond 6, Va. (Tel MIlton 4-3255)
Pres.: Paul K. Heim
Dir.-Research & Dev.: Dr. A. H. Child **RE**

COMMUNITY ENGRG. CORP.
Box 824, State College, Pa. (Tel. ADams 7-7221)
Sales: Floyd B. Fischer

COMPUTER CONTROL CO., INC.
92 Broad St., Wellesley 57, Mass. (Tel. CEdar 5-6220)
Purch. Agent: Bradford P. Daniels
Dir.-Sales: William Wolfson **GE, TR**

COMPUTER ENGRG. ASSOCIATES, INC.
350 N. Halstead, Pasadena, Calif. (Tel. SY 5-8823)
Purch. Agent: John Brunk
Asst. Purch. Agent: Stan Studebaker
Customer Service Mgr.: Richard T. Campbell

COMPUTER INSTRUMENTS CORP.
92 Madison Ave., Hempstead, L. I., N. Y. (Tel. IVanhoe 3-8200)
Purch. Agent: I. Clinton
Sales Mgr.: J. Herman
GE, CO, TS, TR

COMPUTER-MEASUREMENTS CORP.
5528 Vineland Ave., North Hollywood, Calif. (Tel. STanley 7-0401)
Purch. Agent: R. L. Rondou
Buyer: Darlene P. Tieman
V. P. in Chg. of Sales: J. K. Rondou
GE, CO, TS, TR

CONANT LABORATORIES
6500 O St., Lincoln 5, Nebr. (Tel. 2-5774)
Gen. Mgr.: Mrs. G. Conant **GE**

CONAX CORP.
2300 Walden Ave., Buffalo 25, N. Y. (Tel. REgent 0600)
Purch. Agent: Edgar Kowalski
Sales Mgr.: John M. Considine
MF, WN, PS, GS, GE, CO

CONCO ENGRG. WORKS
Mendato, Ill. (Tel. 2121)
Purch. Agent: P. J. Donahue
Asst. to Exec. V. P.-Sales: J. W. Burch
MF, GS

CONNECTICUT HARD RUBBER CO., THE
407 East St., New Haven 9, Conn. (Tel. SPruce 7-3631)
Purch. Agent: T. E. Grandshaw
Sales Mgr.: J. A. Moffitt, Jr.
MF, WN, PS, GS, GH, TR

CONNECTOR CORP.
6025 N. Keystone Ave., Chicago 30, Ill. (Tel. KEystone 9-3108)
Purch. Agent: J. C. Miller
Sales Mgr.: E. M. Paradise
MF, WN, PS, GS, GE, TS, TR

CONNECTOR CORP. OF AMERICA
3223 Burton Ave., Burbank, Calif. (Tel. VIctoria 9-2129)
Sales: James Friedman
MF, WN, PS, GH, GE, TR

★CONRAD, INC.
141 Jefferson St., Holland, Mich. (Tel. EXport 2-3161)
Purch. Agent: M. G. Pointer
V. P.-Sales: Charles F. Conrad **TS**
★(See advertisement in this issue)

CONSOLIDATED AIRBORNE SYSTEMS, INC.
321 Willis Ave., Mineola, N. Y. (Tel. Pioneer 6-7224)
V. P.-Gen. Mgr.: John I. Nestel
V. P.-Chief Engr.: Leo Stamler
Proj. Engr.: Hugo Daffara
Sales Mgr.: John A. Milbouer
GH, GE, CO, TS, TR

CONSOLIDATED AMERICAN SERVICES, INC.
9999 W. Jefferson Blvd., Culver City, Calif. (Tel. TExas 0-4725)
Purch. Agent: Alan Farnan
Office Mgr.: R. A. Verna
V. P.-Purch.: J. B. Lundquist
Sales Mgr.: J. F. Stokes **PS, GS**

CONSOLIDATED AVIONICS CORP.
800 Shames Dr., Westbury, L. I., N. Y. (Tel. EDgewood 4-8400)
Purch. Agent: Carl Cooper
Sales Mgr.: Peter J. Reutes
MF, PS, GS, GH, GE, CO, TS, TR

CONSOLIDATED CONTROLS CORP.
13 Durant Ave., Bethel, Conn. (Tel. Pioneer 3-6721)
Purch. Agent: C. F. Joyce
Mgr.-Contract Admin.: C. M. Colt
MF, WN, PS, GS, GE, CO, TS, TR

CONSOLIDATED DIESEL ELECTRIC CORP., TEST EQUIP. DIV.
1 John St., Stamford, Conn. (Tel. DAvis 5-2261)
Purch. Agent: John Budnik
Chief Appl. Engr.: K. C. Gerhardt
Sr. Appl. Engrg.: Burt Rowe
Appl. Engr.: Hank Maron
Gen. Mgr.-Sales: L. B. Haberman
GS, TS

CONSOLIDATED ELECTRODYNAMICS CORP.
300 N. Sierra Madre Villa, Pasadena, Calif. (Tel. RYan 1-8421)
Dir.-Purch.: Mario Gardner
V. P.-Mktg.: R. L. Smallman

CONSOLIDATED INDUSTRIES, INC.
Mixville Rd., West Cheshire, Conn. (Tel. Cheshire—BRowning 2-5371)
Sales Dept.: Gordon S. Tracy **MF**

CONSOLIDATED RADIO PRODUCTS CO.
350 W. Erie St., Chicago 10, Ill. (Tel. DElaware 7-6900)
Purch. Agent: R. B. Smith
V. P.-Gen. Mgr.-Sales: H. J. Moskow
GS

CONSOLIDATED WIRE & ASSOCIATED COMPANIES
1635 S. Clinton St., Chicago 16, Ill. (Tel. HA 1-4441)
Sales Mgr.: J. J. Mann
MF, PS, GS, GH, CO, TR

L. L. CONSTANTIN & CO.
Rt. 46, Lodi, N. J. (Tel GRegory 1-0100)
Purch. Agent: E. Schmidt
Controller: E. Matthews
Chief Engr.: C. Yocum
Dir.-Sales: W. J. Casey
MF, PS, GS, GE, TR

CONTINENTAL AVIATION & ENGRG. CORP.
12700 Kercheval, Detroit 15, Mich. (Tel. VAlley 2-1500)
Dir.-Purch.: Carl L. Schiller
Purch. Agent-Toledo Div.: J. Watson, 1330 Laskey Rd., Toledo, O. (Tel. GReenwood 5-4641)
Mgr.-Sales & Serv.: Kenneth C. Smith
PS, GS, GH

CONTINENTAL CARBON, DIV.-WIRT CO.
5221-27 Green St., Philadelphia 44, Pa. (Tel. GErmantown 8-9334)
Purch. Agent: Kalman Lifson
Sales Mgr.: William M. Wood **GE**

CONTINENTAL CONNECTOR CORP.
34-63 56th St., Woodside 77, N. Y. (Tel. TW 9-4422)
Purch. Agent: A. Jacobs MF, GE

CONTINENTAL DIAMOND FIBRE CORP., SUB.—THE BUDD CO.
Newark 62, Del. (Tel ENdicott 8-8531)
Dir.-Purch.: W. H. Walker, Jr.
Asst. Gen. Purch. Agent: E. A. Cain
V. P.-Mktg.: F. M. Graver
MF, WN, PS, GS, GH, GE, TS, TR

CONTINENTAL METALS, INC.
7001 Santa Monica Blvd., Los Angeles 38, Calif. (Tel. HOllywood 9-8383)
Purch. Agent & Sales: I. H. Taylor

CONTINENTAL MOTORS CORP.
Market St., Muskegon, Mich. (Tel. 2-7631)
Pres. & Gen. Mgr.: C. J. Reese

CONTINENTAL RUBBER WORKS
1963 Liberty St., Erie 6, Pa. (Tel. 2-5261)
Purch. Agent: Robert A. Bailey
Sales Mgr.: Charles C. Shenk
MF, WN, PS, GS

CONTINENTAL SCREW CO.
459 Mt. Pleasant St., New Bedford, Mass. (Tel. WYman 3-2621)
Purch. Agent: Edward Pettengill
Gen. Sales Mgr.: Victor Ladetto MF

CONTROL DATA CORP.
501 Park Ave., Minneapolis 15, Minn. (Tel. FEderal 9-0947)
Dir.-Purch.: L. Bernier
Dir.-Mktg.: W. K. Drake
MF, WN, PS, GS, GH, GE, CO, TS, TR

CONTROL PRODUCTS INC.
306 Sussex St., Harrison, N. J. (Tel. HU 2-0213)
Purch.: H. R. Brester
Sales Mgr.: A. W. King PS, GS, GE, TR

CONTROLS CO. OF AMERICA
9555 Soreng Ave., Schiller Park, Ill. (Tel. NAtional 5-9000)
Purch. Agents: L. Manfre & H. Keller
V. P.-Sales: G. Calkins & A. Topp
MF, PS, GS, GH, GE, CO, TR

CONVAIR-ASTRONAUTICS DIV., GENERAL DYNAMICS CORP.
5001 Kearney Villa Rd., San Diego 12, Calif. (Tel. BR 7-6750)
Material Dept.: C. F. Uhden
Gen. Purch. Agent: W. J. Flanagan
Purch. Agents: E. Fellows, Jr., C. C. Farnsworth & C. T. Talbott

CONVAIR-POMONA
P. O. Box 1011, Pomona, Calif. (Tel. LYcoming 9-5111)
Mgr.-Material: R. D. Webster
Purch. Agent—Major, Minor Std. Parts & Raw Material: R. J. Hartmayer
Purch. Agent—Subcontracts, Supplies & Services: O. W. Connell
Purch. Agent—Non-productive & Facilities: F. W. Burke
Purch. Agent—Special Components: J. D. Currier

FRANK R. COOK CO.
36 S. Santa Fe Dr., Denver 23, Colo. (Tel. SHerman 4-1753)
Purch.: Jake Mowsray
GS, GH, GE, TR

COOPER ALLOY CORP.
Hillside, N. J. (Tel. MU 8-4120)
Mgr.-Adv. & Sales Prom.: Stuart F. Cooper
MF, GS

★COOPER DEVELOPMENT CORP.
2626 S. Peck Rd., Monrovia, Calif. (Tel. HIllcrest 6-3138)
Purch. Agent: Eugene Binford
Mgr.-Contracts Planning: Malcolm C. Tucker
★(See advertisement in this issue)

CO-OPERATIVE INDUSTRIES, INC.
100 Oakdale Rd., Chester, N. J. (Tel. 255)
Purch. Agent: E. F. Youngquist
Asst. Purch. Agent: Barnes Barker
V. P.-Sales: V. C. Bonardel
MF, PS, GS, GE, TS, TR

COOPER-BESSEMER CORP., THE
Mt. Vernon, O. (Tel. EX 3-0121)
Asst. Mgr.-Public Relations: Hugh T. Watson GS

COPPERWELD STEEL CO., WIRE & CABLE DIV.
Glassport, Pa. (Tel. NOrth 4-7131)
Purch. Agent: M. M. Siegel
Sales Mgr.: F. E. Leib
MF, PS, GS, GH, TS, TR

COPPUS ENGRG. CORP.
344 Park Ave., Worcester 10, Mass. (Tel. PLeasant 2-5638)
Purch. Agent: H. C. Hult
Sales Mgr.: E. Kundig PS, GS, GH

F. W. CORBETT SCIENCE LABS.
3117 Venice Blvd., Los Angeles 19, Calif. (Tel. REpublic 3-5251)
Purch.: F. W. Corbett GE, TS, TR

CORBIN PRODUCTS DIV.
Crescent Plaza Bldg. 306-B, Long Island City 1, N. Y. (Tel. ST 6-0700)
Mgr.-Sales: M. Bellew
MF, WN, PS, GS, GH, GE

CORDO MOLDING PRODUCTS, INC.
230 Park Ave., New York 17, N. Y. (Tel. MUrray Hill 6-4326)
Purch. Agent: Robert F. Walsh, 34 Smith St., Norwalk, Conn. (Tel. VOlunteer 6-4438)
V. P.-Sales: William F. Condon
MF, WN, PS

★CORNELIUS CO., THE
550 39th Ave., N. E., Minneapolis 21, Minn. (Tel. SUnset 8-8613)
Purch. Agent: Fred A. Anderson
Mgr.-Aircraft Equip. Sales: J. W. Mahanay
MF, PS, GS, GH, GE, TR
★(See advertisement in this issue)

CORNELL-DUBILIER ELECTRIC CORP.
Hamilton Blvd., South Plainfield, N. J. (Tel. PLainfield 6-9000)
Dir.-Purch.: Paul H. Burbage
Sales Mgr.-Mfg. Div.: Arthur Williams
TR

CORNING GLASS WORKS
Corning, N. Y. (Tel. 2-5011)
Dir.-Purch.: T. S. Wood
Purch. Agent: Ralph Baker
Mgr.-Staff Sales: B. S. Peirson
MF, WN, PS, GS, GH, GE, TR

CORRUGATED PAPER PRODUCTS, INC.
2233 Utica Ave., Brooklyn, N. Y. (Tel. ESplamade 7-6112)
Pres.: J. Kapor

CORSON ELECTRIC MFG. CORP.
540 39th St., Union City, N. J. (Tel. UNion 6-4227)
Purch. Agent: Frank E. Dame TR

COSA CORP.
Chrysler Bldg., 405 Lexington Ave., New York 17, N. Y. (Tel. YUkon 6-9696)
Sales Mgr.: P. M. Aubry GS, TS, TR

COUCH ORDNANCE, INC.
3 Arlington St., North Quincy, Mass. (Tel. BL 8-4147)
Purch. Agent: S. D. Bellis
Mgr.-Relay Div.-Sales: B. W. Gray
GE, TR

COX & CO., INC.
115 E. 23rd St., New York 10, N. Y. (Tel. ORegon 4-4727)
Prod. Mgr.: Edward Kraft
V. P.-Sales: Herbert M. Brusman
MF, WN, GS, GE

★CRAIG SYSTEMS, INC.
360 Merrimack St., Lawrence, Mass. (Tel. MUrdock 8-6961)
Dir.-Materiel: Jack Frost
Purch. Agent: James Aicardi
Buyers: William Bresnahan, Barry Barker & Mildred Kaczor
Dir.-Sales Engrg.: Perry L. Nies
GS, GH, GE, TS, TR
★(See advertisement in this issue)

CRANE CO.
836 S. Michigan Ave., Chicago, Ill. (Tel. WA 2-3123) MF, PS, GS, TS

CRANE PACKING CO.
6400 Oakton St., Morton Grove, Ill. (Tel. ORchard 4-0100)
Purch.: Victor Gorgleth
Buyers: William Parlette, Charles Kazarian, Harry Schnur
V. P.-Sales: V. E. Vorhees

CRATEX MFG. CO.
1600 Rollins Rd., Burlingame, Calif. (Tel. OXford 7-1660)

CRESCENT ENGRG. & RESEARCH CO.
5440 N. Peck Rd., El Monte, Calif. (Tel. GIlbert 4-0528)
Purch. Agent: J. Wackerman
Adv. Mgr.: E. Michener
Sales Mgr.: Scott B. Linn
PS, GS, GE, CO, TS, TR

A. CRESCI & SON, INC.
Blvd. & Grape Sts., Vineland, N. J. (Tel. OX 1-1700)
Purch. Agent: Raymond J. Hemighaus
GH

CROMER MFG. & ENGRG., INC.
2138 E. 88th St., Los Angeles 2, Calif. (Tel. LUdlow 2-5383)
Purch. Agent: Mildred Hilgardner
Plt. Supt.: Darrel L. Sewart
V. P.-Chg. Sales: Harry S. Green
MF, PS, GS, GH

CROMPTON & KNOWLES CORP.
93 Grand, Worcester, Mass. (Tel. PL 3-5431)
Purch. Agent: Joseph J. Benoit
Mgr.-Special Mfg. Dept.: R. J. McGivney
MF

CRO-PLATE CO., INC., THE
747 Windsor St., Hartford 1, Conn. (Tel. JAckson 7-8273)
Purch. Agent: Nicholas Nedweden
Sales Mgr.: Alan R. Burman

CROWN INDUSTRIAL PRODUCTS CO.
713 Amsterdam, Woodstock, Ill. (Tel. 1900)
Materials Mgr.: Dean Yetter
Sales Mgr.: Jess Lobdell MF

CRUCIBLE STEEL CO. OF AMERICA
Oliver Bldg., P. O. Box 88, Pittsburgh, Pa. (Tel. ATlantic 1-3800)
Dir.-Purch.: R. O. Bridge
Buyers: G. G. Dyer, Jr., D. Burman, C. C. Kennedy MF, WN, PS, GS, GE, TS

CRYSTAL-X CORP.
112 W. Lenni Rd., Lenni Mills, Pa. (Tel. GLobe 9-1000)
Purch. Agent: E. F. Westlake
Sales Mgr.: W. H. Seiler
MF, WN, PS, GS

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

CUBIC CORP.
5575 Kearny Villa Rd., San Diego 11, Calif. (Tel. BRowning 7-6780)
Dir.-Purch.: John C. Buchan
Buyers: Bill Freres, George Dotson & Gussie Seeley
Bus. Admin.-Sales: Donald E. Root
GS, GE, CO, TS, TR

JAMES CUNNINGHAM SON & CO., INC.
33 Litchfield, Rochester 8, N. Y. (Tel. BAker 5-7240)
Purch. Agent: James Elliott
Sales: Peter F. Cunningham
GS, GE, CO, TS, TR

CUNO ENGRG. CORP., THE
S. Vine St., Meriden, Conn. (Tel. BEverly 7-5541)
Purch. Agent: Fred Gagnier
V. P.-Mktg.: Carlton H. Winslow
MF, WN, PS, GS, GH, GE, CO, TR

CURTIS UNIVERSAL JOINT CO., INC.
4 Birnie Ave., Dept. M&R, Springfield 7, Mass. (Tel. RE 7-0281)
Sales: T. B. Cavanaugh PS

CURTISS-WRIGHT CORP.
Valley Blvd., Wood-Ridge, N. J. (Tel. WEbster 3-0800)
Chrm. & Pres.: Roy T. Hurley

CURTISS-WRIGHT CORP., ELECTRONICS DIV.
631 Central Ave., Carlstadt, N. J. (Tel. GEneva 8-4000)
Purch. Mgr.: F. L. Nicholls
Buyer-Sheet Metal: John Kroll
Buyer-Subcontract: C. D. Post
Buyer-Resistors, Relays, Rheostats: C. Guerriere
Buyer-Tubes, Rectifiers, Knobs, Switches: R. Cucci
Buyer-Machined Parts, Gears, Raw Materials, Plating & Finishing: A. Protono
Gen. Sales Mgr.: Charles O. Cary
PS, GS, GE, CO, TS, TR

CURTISS-WRIGHT CORP., INDUSTRIAL & SCIENTIFIC PRODUCTS DIV.
P. O. Box 110, Princeton, N. J. (Tel. SWinburne 9-0500)
Suprvsr. of Purch.: V. L. Croal
Gen. Mgr.-Sales: H. S. Bamford
GS, GH, GE, CO, TS, TR

CUSTOM COMPONENTS, INC.
P. O. Box 248, Caldwell, N. J. (Tel. CAldwell 6-3403)
Sales: Harold I. Danziger TR

CUTLER-HAMMER INC.
315 N. 12th St., Milwaukee 1, Wisc. (Tel. BRoadway 1-7800)
PS, GS, GH, GE, CO, TS, TR

CYCLE TRANSFORMER CORP.
356 Glenwood Ave., East Orange, N. J. (Tel. ORange 4-0731)
Purch. Agent: J. U. Dion
Chief Engr.: H. Edgar Snow
Sales Engr.: Paul M. Brubaker
GS, GE, CO, TS, TR

D K MFG. CO.
5059 S. Kedzie, Chicago 32, Ill. (Tel. RE 7-3311)
Purch. Agent: Ted Kwasnik
Sales Mgr.: Paul J. Firring
MF, PS, GS, GH

D & R, LTD.
402 E. Gutierrez St., P. O. Box 1500, Santa Barbara, Calif. (Tel. WOodland 5-4511)
Purch. Agent: C. E. Schaefer
V. P.-Purch.: E. D. Sperry
Sales Mgr.: J. A. Moseley
PS, GS, GE, CO, TS, TR

D. S. D. MFG. CO., THE
2964 Whitney Ave., Hamden, Conn. (Tel. ATwater 8-1678)
Wks. Mgr. & Secy.: William J. Devin
MF, PS, GS

DAGE ELECTRIC CO., INC.
67 N. 2nd St., Beech Grove, Ind. (Tel. STate 6-0458)
Purch. Agent: Roger Mays
Gen. Mgr.: Calvin J. Zehr GE, TR

DAKOTA ENGRG., INC.
6641 Crenshaw Blvd., Los Angeles 43, Calif. (Tel. PLeasant 8-6090)
Sales Mgr.: Betty Boundy
MF, PS, GS, GH, TS

DALE PRODUCTS, INC.
P. O. Box 136, Columbus, Nebr. (Tel. LOcust 4-3131)
Purch. Agent: Wallace Brunken
Sales Mgr.: R. H. Engstrom
MF, WN, PS, GS, GH, GE, CO, TS, TR

★DALMO VICTOR CO., DIV.-TEXTRON INC.
1515 Industrial Way, Belmont, Calif. (Tel. LYtell 1-1414)
Purch. Agent: Ralph Brown
Supt.-Outside Procurement: Bill Wurfer
Buyer-Electronic Components: Mike Lichtenstein
Buyer-Electrical Supp., Bearings: Hal Amberg
Buyer-Maintenance, Machine Tools, Equip.: Al Viano
Buyer-Stationary, AN Hardware & Fittings, Raw Materials: Ken Irwin
Dir.-Sales: George C. Stewart
MF, WN, PS, GS, GE, CO, TS, TR
★(See advertisement in this issue)

DALMORE CORP.
47 Prospect St., Woburn, Mass. (Tel. WOburn 2-5390)
Purch. Agent: R. A. Joyce
MF, WN, PS, GS, GE, TR

DALWELD CO. INC.
15 Bertel Ave., Mt. Vernon, N. Y. (Tel. MOunt Vernon 4-8698)
Pres.: Jerry Robinson MF, PS, GE, TR

DAMPP-CHASER, INC.
1440 Ridgewood Blvd., Hendersonville, N. C. (Tel. OXford 3-6084)
Purch.: B. Dalton
Adv. Mgr.-Purch.: Nicholas Semaschko, Jr.
Sales Mgr.: O. Jack Buckley PS, GS

C. R. DANIELS, INC.
Daniels, Md. (Tel. ELlicott City 1200)
Purch. Agent: D. H. Kelley
Buyers: W. L. Young, F. J. Trumpbour, J. Russell & A. Metz
V. P.-Sales: W. E. Carson
MF, PS, GS, GH, TR

DANLY MACHINE SPECIALTIES, INC.
2100 S. Laramie Ave., Chicago 50, Ill. (Tel. BIshop 2-1800)
Purch. Agent: Paul R. Fields
Asst. Purch. Agent: Donald McGibbon
Buyer: William Gardner
V. P.-Press Sales: D. R. Danly
V. P.-Sales, Die Makers Supp.: R. E. Danly
MF, WN, PS, GS, GH, TS

DARCOID CO., INC., THE
145 6th Ave., New York 13, N. Y. (Tel. ALgonquin 5-1393)
Gen. Mgr.: Fred W. Sheer MF, PS

DATA INSTRUMENTS, DIV.-TELECOMPUTING CORP.
12838 Saticoy St., North Hollywood, Calif. (Tel. STanley 7-8181)
Purch.: Mrs. Jean Stetler
Sales Mgr.: R. W. Woodring TR

★DATA-CONTROL SYSTEMS INC.
39 Rose St., Danbury, Conn. (Tel. Pioneer 3-3896)
V. P.-Purch.: Weems E. Estelle
GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

DATEX DIV., G. M. GIANNINI & CO., INC.
1307 S. Myrtle Ave., Monrovia, Calif. (Tel. ELliot 9-5381)
Operations Mgr.: Charles S. Palmer
Buyers: Richard V. Ireland & B. J. Benson
Sales Mgr.: John W. Bodnar TR

DATRAN ELECTRONICS, DIV.-MID-CONTINENT MFG., INC.
1836 Rosecrans Ave., Manhattan Beach, Calif. (Tel. OSborne 5-7131)
Purch. Agent: Robert D. Errington
Gen. Mgr.: Lewis Emmerich
Dir.-Customer Relations: Allen J. Edwards
Tech. Dir.: Richard E. George
GE, CO, TS, TR

DAVEN CO., THE
Rt. 10, Livingston, N. J. (Tel. LIvingston 6-4300)
V. P.-Purch.: G. H. Newman
Buyers: A. M. Watkins & I. Valentine
Sales Mgr.: E. L. Grayson
GS, GE, CO, TS, TR

DAVENPORT MFG. CO.
1713 N. Ashland Ave., Chicago 22, Ill. (Tel. DIckens 2-5620)
Treas.: A. W. Davenport
PS, GS, GE, CO, TS, TR

DAVIDSON MFG. CO.
2223 Ramona Blvd., West Covina, Calif. (Tel. EDgewood 7-7281)
Purch. Agent.: O. A. Kidwell
Sales Mgr.: James E. McBride
WN, PS, GS, GE, CO, TS, TR

DAY-RAY PRODUCTS, INC.
1133 Mission St., South Pasadena, Calif. (Tel. RYan 1-1189)
Secy.-Treas.: Mrs. W. D. Adams

DAYSTROM INSTRUMENT, DIV.-DAYSTROM, INC.
Archbald, Pa. (Tel. JErmyn 1100)
Dir.-Purch.: A. I. Manuel
V. P.-Sales & Contracts: Howard J. Warnken
MF, WN, PS, GS, GE, TR

DAYSTROM PACIFIC DIV., DAYSTROM, INC.
9320 Lincoln Blvd., Los Angeles 45, Calif. (Tel. ORchard 4-7100)
Purch. Agent: Russel Reid
Dir.-Sales: J. F. Zilman GE

DAYTON AIRCRAFT PRODUCTS, INC.
P. O. Box 8007, 812 N. W. First St., Ft. Lauderdale, Fla. (Tel. JAckson 3-5451)
V. P.-Purch.: H. A. Cline
Dir.-Sales: J. H. Sampson
MF, WN, PS, GS, GE, TS, TR

DAYTON AVIATION RADIO & EQUIPMENT CORP.
Box 167, Vandalia, Ohio (Tel. TWinoaks 8-4627)
V. P.: Albert Sherwatt
Purch. Agent: Earl Balger
Sales Mgr.: Elliott Polansky
GS, GH, GE, TS, TR

DAYTON MFG. CO., INC.
17 Front St., Dayton 2, O. (Tel. BA 4-8503)
Pres.: J. Grover
MF, WN, PS, GS, GH

DAYTRONIC CORP.
216 S. Main St., Dayton 2, O. (Tel. BAldwin 3-7618)
Prod. Mgr.: W. R. Winger
Chief Engr.-Purch.: R. M. Kinkead
Clerk-Purch.: B. Grenner
Head-Sales: M. M. Moorhead, Jr.
PS, CO, TS

JOE DAVIDSON & ASSOCIATES
P. O. Box 108, South Gate, Calif. (Tel. NEvada 6-2245)
Gen. Mgr.: Fred Simpson

DEAN & BENSON RESEARCH INC.
16 Richmond St., Clifton, N. J. (Tel. GRegory 1-1600)
Production: Henry McNeal
Chief Draftsman: Herbert Gynan
Chief Engr.: Leo Avondoglio
Plt. Mgr.: Joseph Micka
Sales Mgr.: Richard C. Portofee
MF, WN, PS, GS, GH, TR

DEARBORN ELECTRONIC LABS.
1421 N. Wells St., Chicago, Ill. (Tel. WA 3-2412)
Purch. Agent: George Waiflein
Gen. Mgr.-Sales: R. J. Simpson
GE, TR

DECKER CORP., THE
1361 Frankford Ave., Philadelphia 25, Pa. (Tel. GArfield 5-2300)
Purch. Agent: John D. Moore
Asst. Purch. Agent: A. Richard Newhouse, Jr.
V. P. & Gen. Mgr.-Sales: Thomas W. Spirito
CO, TS

DE COURSEY ENGRG. LAB.
11828 W. Jefferson Blvd., Culver City, Calif. (Tel. EX 7-9668)
W. E. De Coursey GE

DEFENSE PRODUCTS GROUP, AMERICAN MACHINE & FOUNDRY CO.
1101 N. Royal St., Alexandria, Va. (Tel. KIng 9-9110)
Sales Mgr.: J. H. Blades
Dir.-Contracts: N. H. Hundt

DEFIANCE ENGRG. & MICROWAVE CORP.
Beverly Airport, Box 488, Beverly, Mass. (Tel. WAlker 2-8100)
Gen. Mgr.: Benjamin B. Cravens
Sales Mgr.: George S. Sunderland
WN, PS, GS, GH, GE, CO, TS, TR

DEJUR-AMSCO CORP.
45-01 Northern Blvd., Long Island City 1, N. Y. (Tel. AStoria 8-1040)
Purch. Dir.: P. Heaney
Indust. Sales Mgr.: N. J. Geldman
GS, GE, CO, TR

DEL ELECTRONICS CORP.
521 Homestead Ave., Mt. Vernon, N. Y. (Tel. OWens 9-3232)
V. P.-Sales: H. J. DiGiovanni
GS, GE, CO, TR

DELTA CHEMICAL WORKS, INC.
23 W. 60th St., New York 23, N. Y. (Tel. PLaza 7-6317)
Asst. Dir.-Purch.: P. K. Massey
Comptroller: Max Lendner
MF, WN, PS, GS, GH, GE

DELTA DESIGN ENGINEERS, INC.
3039 Adams Ave., San Diego 16, Calif. (Tel. AT 1-1211)
Pres.: Trigg Stewart
V. P.: David P. Comey GS

DELTA UNIFORMS, DIV.-HIGHWAY OUTFITTING CO., INC.
141 E. 88th St., New York, N. Y. (Tel. MUrray Hill 9-6360)
Prod. & Proc. Mgr.: M. Wecksler
Exec. Sales Mgr.: H. A. Zeimer

DEMORNAY-BONARDI
780 S. Arroyo Pkwy., Pasadena, Calif. (Tel. SYcamore 2-4142)
Purch. Agent: James R. Gillis
Sales: Mary G. Ekstrom
MF, WN, PS, GS, GE, CO, TS, TR

DENISON ENGRG. DIV., AMERICAN BRAKE SHOE CO.
1160 Dublin Rd., Columbus 16, O. (Tel. HUdson 8-1191)
Dir.-Purch.: C. W. Lindahl
Purch. Agent: G. T. Hays
Dir.-Sales: Denison Neale GS, TS

DENNIS CHEMICAL CO.
2701 Papin St., St. Louis, Mo. (Tel. PRospect 6-1868)
Sales: Milton Carlie

DENVER RESEARCH INSTITUTE
University of Denver, Denver 10, Colo. (Tel. SH 4-1811)
Dir.: Shirley A. Johnson, Jr.
Bus. Mgr.: George M. Canetta RE

F. W. DERBYSHIRE, INC.
157 High St., Waltham 54, Mass. (Tel. TWinbrook 4-2900)
Sales: Shaw Smith MF

DERRICK MFG. CO
590 Duke Rd., Buffalo 25, N. Y. (Tel. REgent 9010)
Treas.: R. G. Derrick

DESIGN TOOL CORP.
80 Washington St., New York 6, N. Y. (Tel. WHitehall 3-7466)
V. P.: Carl Kertesz

DETROIT DIESEL ENGINE DIV.-GENERAL MOTORS CORP.
13400 W. Outer Dr., Detroit 28, Mich. (Tel. KE 1-7100)
Mgr.-Purch. & Prod.: John E. McKenna
Gen. Sales Mgr.: Robert E. Hunter
PS

DETROIT HOIST & MACHINE CO.
8204 Morrow St., Detroit 11, Mich. (Tel. TR 5-8344)
Purch. Agent: J. S. Kolasa
Sales Engr.: V. A. Fulton MF, GS

TOBE DEUTSCHMANN CORP.
Providence Hwy., Norwood, Mass. (Tel. NOrwood 7-2620)
Purch. Agent: Henry P. Shopneck
Sales Mgr.: Thomas A. Crawford

DEVCO ENGRG. INC.
P. O. Box 387, Caldwell, N. J. (Tel. CA 6-0610)
Purch. Agent: G. Schmidt
Sales: C. Allen
MF, WN, PS, GH, GE, CO, TS, TR

DEVELOPMENT ENGRG. CO., INC.
9 Cross St., Norwalk, Conn. (Tel. VOlunteer 6-7720)
Chief Engr.: Richard L. Seidman

DeVILBISS CO., THE
300 Phillips Ave., Toledo, O. (Tel. GReenwood 4-5411)
Mgr.-Adv. & Sales Prom.: H. A. Lange
MF, PS, GS, GH

J. P. DEVINE MFG. CO.
49th St. & AVRR, Pittsburgh 1, Pa. (Tel. MUseum 2-5740)
Purch. Agent: Wm. Bagaleg
Sales: R. H. Brockett
MF, WN, PS, GS, TS

DeWALT DIV., AMERICAN MACHINE & FOUNDRY CO.
Fountain Ave., Lancaster, Pa. (Tel. EXpress 3-5831)
V. P. & Gen. Sales Mgr.: Truman Jones
Dir.-Purch.: Hugh Johnson

DIAL PRODUCTS CO.
9 Ave. "E", Bayonne, N. J. (Tel. HEmlock 7-0720)
V. P.-Purch.: Paul Schechter
Sales Mgr.: E. Kay PS, GS, GH, GE

DIALIGHT CORP.
60 Stewart Ave., Brooklyn 37, N. Y. (Tel. HYacinth 7-7600)
Purch. Agent: E. S. Forman GS, TR

DIAMOND ANTENNA & MICROWAVE CORP.
7 North Ave., Wakefield, Mass. (Tel. CRystal 9-4650)
Purch. Agent: William L. Page
Asst. Purch. Agent: William Rand
Gen. Mgr.-Sales: Albert S. Hovannesian
WN, PS, GE, CO, TS, TR

DIAMOND DRILL CARBON CO., THE
244 Madison Ave., New York 16, N. Y. (Tel. LExington 2-3006)
Sales: Bernard Rhodes GS

DIAMONITE PRODUCTS MFG. CO.
1232 Cleveland Ave., N. W., Canton, O. (Tel. GLendale 6-8195)
Mgr.-Purch.: Harold Himes, Shreve, O. (Tel. JOseph 7-3401)
Mgr.-Mktg.: R. H. Rudolph
MF, WN, PS, GS, GE, TS, TR

J. W. DICE CO.
16 Highwood Ave., Englewood, N. J. (Tel. LOwell 9 0471)
Purch. Agent: M. Strain
Asst. Purch. Agent: E. Franz
Sales: E. Van Ressel CO, TS

DIEHL MFG. CO.
1224 Finderne Ave., Somerville, N. J. (Tel. RAndolph 5-2200)
Purch. Agent: H. A. Conrad
Purch. Dept.: J. Rizzo, F. Boyne & W. Wiggins
V. P.-Sales: A. R. Booth
PS, GS, GE, TS, TR

HENRY G. DIETZ CO., INC., THE
12-16 Astoria Blvd., Long Island City 2, N. Y. (Tel. RAvenswood 6-3347)
Purch.: M. Pheasey
WN, PS, GS, GH, GE, CO, TS

DIGITRAN CO., THE
45 W. Union St., Pasadena, Calif. (Tel. RY 1-9667)
Purch. Agent: W. J. Barmore
CO, TS, TR

DIGITRONICS CORP.
Albertson Ave., Albertson, N. Y. (Tel. PI 7-5090)
Purch.: Mignon Kinsman
Sales: Norman Grieser
PS, GS, GH, GE, TS, TR

DILECTRIX CORP.
Allen Blvd., Farmingdale, L. I., N. Y. (Tel. CHapel 9-7999)
Pres.: John V. Petriello
V. P.: Michael LaTorra
MF, PS, GE, TR

DILL MFG. CO., THE
700 E. 82nd St., Cleveland 3, O. (Tel. UTah 1-3200)
Dir.-Purch.: C. W. Bonifield
Asst. Purch. Agent: E. Spacone
Mgr.-Sales: B. S. Byall MF, PS, TS

W. C. DILLON & CO., INC.
14620 Keswick St., Van Nuys, Calif. (Tel. STate 5-3168)
Purch. Agent: Earl D. Roberts
Sales Mgr.: George A. Dillon
PS, GS, GE, TS, TR

DIMCO-GRAY CO.
207 E. 6th St., Dayton 2, O. (Tel. BAldwin 2-6703)
Purch.: J. D. Gray
Sales Mgr.: C. F. Dearth
MF, PS, GS, GE, CO

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

DINION COIL CO., INC.
Caledonia, N. Y.
Purch. Agent: R. Eldredge **GE**

DIRILYTE CO. OF AMERICA, INC.
P. O. Box 747, 1142 S. Main St., Kokomo, Ind. (Tel. GLadstone 2-5688)
V. P. & Secy.: Robert R. Arnett
MF, WN

DIT-MCO, INC., ELECTRONICS DIV.
911 Broadway, Kansas City 5, Mo. (Tel. HArrison 1-8484)
Purch. Agent: William O. Britt
V. P.-Sales: W. W. Hannon
GS, GH, GE, CO, TS, TR

DITTMORE-FREIMUTH CORP.
2517 E. Norwich St., Milwaukee 7, Wisc. (Tel. HUmboldt 3-7724)
Purch. Agent: Donald Kleinke
MF, GS, GH, GE

★DIVERSEY ENGRG. CO.
10550 W. Anderson Place, Franklin Park, Ill. (Tel. GLadstone 1-0200)
Purch. Agent: Walter Kloske
Asst. Purch. Agents: Joseph Haas & Allen Shenker
MF, WN, PS, GS, GH, GE, TS, TR
★(See advertisement in this issue)

DIVISION LEAD CO.
7742 W. 61st Place, Summit, Ill. (Tel. Chicago—REliance 5-8600)
MF, WN, PS, GE, CO, TR

DIXON CORP.
Burnside St., Bristol, R. I. (Tel. CLifford 3-7500)
MF, WN, PS, TR

DMETER MFG. CO., INC.
22-24 Larkin Plaza, Yonkers, N. Y. (Tel. 9-1770)
Pres.: D. Yablonsky **GE**

DODGE MFG. CORP.
S. Union St., Mishawaka, Ind. (Tel. BLackburn 9-2421)
V. P.-Prod. & Purch.: Earl Wedlake
Dir.-Prod. & Purch.: Donald Saunter
Purch. Agent: Edwin Rhodes
Asst. Purch. Agent: Clifford Miller
Steel Buyer: Clifford Mechling
V. P. in Chg. of Sales: Harry A. Torson
GS, GH, GE

DOLINKO & WILKENS, INC.
1907 Summit Ave., Union City, N. J. (Tel. UNion 7-6630)
V. P.: Louis Dolinko **GE, TR**

DON-LAN ELECTRONICS CO.
1101 Olympic Blvd., Santa Monica, Calif. (Tel. EX 4-0718)
Purch.: Daniel J. Pearlman
GH, GE, TR

★DORNE & MARGOLIN, INC.
29 New York Ave., Westbury, L. I., N. Y. (Tel. EDgewood 4-3200)
Purch. Agent: J. Escollette
Buyer: O. M. Portocarrero
Sales Supvr.: David L. Ward **GS, GE, TR**
★(See advertisement in this issue)

DORSETT LABS., INC.
P. O. Box 862, 401 E. Boyd St., Norman, Okla. (Tel. JEfferson 4-3750)
Dir.-Purch.: Remy M. Perot
Sales Mgr.: George E. Robertson
GS, GH, GE, CO, TS, TR

DOTY ACOUSTICA ELECTRONIC LABS.
Tobyhanna, Pa. (Tel. MP-5355)
Engr.-Purch.: Jose Masri **GE, TS**

DOUGLAS AIRCRAFT CO., INC.
Santa Monica, Calif.
Chief Missiles Engr.: E. P. Wheaton
Missiles Design Engr.: Max W. Hunter

DOUGLAS MICROWAVE CO., INC.
252 E. Third St., Mt. Vernon, N. Y. (Tel. MOunt Vernon 8-6900)
Purch. Agent: Leonard G. Geier
Sales Mgr.: Herbert M. Hendlin
PS, GE, CO, TS, TR

DOW CHEMICAL CO., THE
Midland, Mich. (Tel. TEmple 2-2311)
Dir.-Purch.: M. E. Lefevre
Dir.-Sales: D. K. Ballman

TURNER F. DOW
261 Oakridge Dr., Rochester 17, N. Y.
Turner F. Dow

DOW-ELCO, INC.
1313 W. Olympic Blvd., Montebello, Calif. (Tel. RAymond 3-1288)
Pres.: J. W. Eldridge **MF, PS**

DREMEL MFG. CO.
2420 18th St., Racine, Wisc. (Tel. MElrose 3-8267)
E. A. Erdman **GS**

DRESSEN-BARNES CORP.
250 Vinedo Ave., Pasadena, Calif. (Tel. RYan 1-0643)
Sales Mgr.: George A. Hall **GS**

DRIAIRE, INC.
132 S. Main St., South Norwalk, Conn. (Tel. TEmple 8-0686)
Mgr.-Purch.: M. S. Miller
Mgr.-Prod.: R. W. Haines
Mgr.-Maintenance: M. Hollis
Mgr.-Sales: J. H. Donovan
MF, GS, GH, GE, TS, TR

DRILUBE CO.
723 W. Broadway, Glendale, Calif. (Tel. CH 5-1806)
Purch. Agent: Gordon Leaf
Asst. Purch. Agent: Joan Batian
Plt. Mgr.: Frank Niven
Lab. Mgr.: Larry Dunsmore
V. P.-Sales: R. W. Young
MF, WN, PS, GS, GE

WILBUR B. DRIVER CO.
1875 McCarter Hwy., Newark 4, N. J. (Tel. HUmboldt 2-5550)
Purch. Agent: Edwin J. Looges
Exec. V. P.-Purch.: Sidney A. Wood
Sr. V. P.-Purch.: William J. Wind
V. P.-Research & Engrg.: H. Clark Smith, Jr.
V. P.-Sales: Norman P. Norlie
MF, WN, PS, GS, GE, TR

DRYOMATIC CORP.
806 N. Fairfax St., Alexandria, Va. (Tel. KIng 9-3060)
Purch. Agent: Walter W. Bolton
Sales Mgr.: Anthony Hass **GS, GH**

DU-CO CERAMICS CO.
Box 278, Saxonburg, Pa. (Tel. FL 2-1511)
Pres.: John J Duke **MF, PS, GE, TR**

M. DUCOMMUN CO.
580 Fifth Ave., New York 36, N. Y. (Tel. PLaza 7-2540)
Mgr.: A. G. Stepchuk **GE, CO, TS**

R. C. DUDEK & CO.
407 N. Maple Dr., Beverly Hills, Calif. (Tel. BRadshaw 2-8097)
Richard C. Dudek
MF, WN, PS, GS, GH, GE, CO, TS, TR

DU KANE CORP.
St. Charles, Ill. (Tel. 2300)
Purch. Mgr.: E. E. Swick
Purch. Agent: R. H. Magden
Mgr.-Govt. & Contract Div.: R. W. Robbins
GS, GE, CO, TS, TR

DUMONT AIRCRAFT FITTING CO.
1401 Freeman Ave., Long Beach 4, Calif. (Tel. GE 3-4931)
Gen. Mgr.: Harry Pahner
Buyers: Helen Hoffman & Shirley Wedekind
Sales: Edith Lowery
MF, WN, PS, GS, GH, GE

DUMONT AVIATION ASSOCIATES
1401 Freeman Ave., Long Beach 4, Calif. (Tel. 3-4931)
Purch. Agent: George MacRae
Buyer: Pat Welsh
Sales Mgr.: E. J. Easterbrook
MF, WN, PS, GS, GH, TS, TR

DUNHAM-BUSH INC.
West Hartford, Conn. (Tel. CHapel 9-8671)
V. P.-Purch.: Frank Carney
Purch. Agent: T. Logan
Application Engr.-Prime Responsibility for Missile Work: E. A. Carell
V. P.-Sales: J. A. Mulcahey
MF, PS, GS, GE, TS, TR

DUNLAP ELECTRONICS, INC.
764 9th St., Des Moines, Iowa (Tel. AT 8-0801)
Pres.: Richard D. Dunlap
MF, PS, GS, GH, GE, CO, TS, TR

DUO-SAFETY LADDER CORP.
513 W. 9th Ave., P. O. Box 497, Oshkosh, Wisc. (Tel. STanley 2480)
Secy.-Treas.: Ervin Schwab **GH**

DURACOTE CORP.
350 N. Diamond St., Ravenna, O. (Tel. AXminster 6-3487)
V. P.-Purch.: W. Randle Truog
Purch. Agent: John Borgert
Gen. Mgr.: John B. Schneller
MF, WN, PS, GS

DURANT MFG. CO.
1955 N. Buffum, Milwaukee 1, Wisc. (Tel. LOcust 2-5035)
Purch. Agent: A. M. Jones
Sales Mgr.: Robert B. Winkler
CO, TS, TR

DUROYD GASKET MFG. CO.
1828 Amsterdam Ave., New York, N. Y. (Tel. Wads 6-5834)
Engr. & Mgr.: G. Berger

DWYER ENGRG. CO., INC.
Pine St. Ext., Nashua, N. H. (Tel. TUxedo 3-3206)
Purch. Agent: W. H. Dwyer
Sales Mgr.: R. C. McNamara
MF, WN, PS, GS, GH, GE, TS, TR

G. M. DYKES IRON WORKS, INC.
69 N. W. 3rd St., Miami 32, Fla. (Tel. FR 4-5960)
Mgr.: George M. Dykes

DYNAC, INC.
395 Page Mill Rd., Palo Alto, Calif. (Tel. DAvenport 6-1755)
Purch. Agent: Dale D. DeWitt
Sales Engr.: E. C. Morgan
GS, GE, CO, TS, TR

DYNAMETRICS CORP.
N. W. Industrial Park, Burlington, Mass. (Tel. BRowning 2-1600)
Purch. Agent: Robert Hambleton
Sub-Contr. Mgr.: Walter McAfee
Sales Mgr.: S. Richard Childerhose
MF, WN, PS, GS, GH, CO, TS, TR

DYNAMIC CONTROLS CORP.
14 Rundelane, Bloomfield, Conn. (Tel. JA 3-9358)
Purch. Mgr.: F. Roth
Gen. Mgr.: T. P. Farkas
MF, PS, GS, GH, GE

DYNAMIC GEAR CO., INC.
20 Merrick Rd., Amityville, L. I., N. Y. (Tel. AM 4-4788)
Purch.: Jaques Edeline
Sales: T. J. Smith **GS, GE**

DYNAMIC INSTRUMENT CO., INC.
42 Carleton St., Cambridge 42, Mass. (Tel. UN 4-7260)
Of. Mgr.-Purch.: Dan Shea
Chief Engr.: George Masters
PS, GE, CO, TS, TR

DYNAMICS INSTRUMENTATION CO., DIV.-ALBERHILL CORP.
1118 Mission St., South Pasadena, Calif. (Tel. RY 1-3318)
Mgr.-Operations & Purch.: Nathan Brownstone
Sales: Geoffrey H. Grey TS, TR

DYNAPAR CORP.
5150 Church St., Skokie, Ill. (Tel. ORchard 4-6655)
Pres.: James E. Everett

DYNAVIA ENGRG. CORP.
860 Fabian Way, Palo Alto, Calif. (Tel. DAvenport 3-5812) GE

DYNEX, INC.
777 Dynex Dr., Pewaukee, Wisc. (Tel. 5811)
Mgr.-Purch.: E. W. Lapp
Dir.-Sales: W. R. Master GS

DZUS FASTENER CO. INC.
Babylon, N. Y. (Tel. MOhawk 9-0494)
Purch. Agent: G. H. Arnold
Sales Mgr.: L. F. Acker MF, PS

ESC CORP.
534 Bergen Blvd., Palisades Park, N. J. (Tel. WIndsor 7-0400)
Purch. Agent: B. Gollop
GE, CO, TS, TR

E-Z-HOOK TEST PRODUCTS
1536 Woodburn Ave., Covington, Ky. (Tel. COlonial 1-1495)
Robert N. Yonger
GS, GH, GE, TS, TR

EAGLE SIGNAL CORP.
202 20th St., Moline, Ill. (Tel. MOline 2-5571)
Purch. Agent: G. W. Cantrall
Asst. Purch. Agent: Elmer Lorenz
Prod. Mgr.: C. E. Corson
Sales Mgr.: E. F. Havey GS, GE, TR

EAGLE-PICHER CO., THE
American Bldg., Cincinnati 1, O. (Tel. PArkway 1-7010)
Purch. Agent: Earl Cannon
MF, WN, PS, GS, GH, GE, TS, TR

EASTERN AIR DEVICES, INC.
385 Central Ave., Dover, N. H. (Tel. 2421)
Purch. Agent: E. J. Hutchinson
PS, GE, TS

★EASTERN INDUSTRIES, INC.
100 Skiff St., Hamden, Conn. (Tel. CHestnut 8-3841)
Purch. Agent: C. D. Phillips
Asst. to Purch. Agent: Robert Jerzyk
Sales Mgr.: H. W. Whitaker
MF, WN, PS, GS, GH, GE, TS, TR
★(See advertisement in this issue)

EASTERN SMELTING & REFINING CORP.
109 W. Brookline St., Boston 18, Mass. (Tel. Commonwealth 6-7504)
Treas.: Maurice G. Alperin
Comptroller: Frank E. Wandrey

EASTERN STAINLESS STEEL CORP.
P. O. Box 1975, Baltimore 3, Md. (Tel. ATwater 8-2000)
Buyer: E. J. Thon
V. P.-Sales: R. C. Cunningham
MF, PS

EASTMAN KODAK CO.
343 State St., Rochester 4, N. Y. (Tel. LOcust 2-6000)
MF, WN, GS, GH, GE, CO, TS, TR

EATON ELECTRONICS CORP.
Eaton Ave., Moodus, Conn. (Tel. TRiangle 3-8628)
Sales Mgr.: Daniel Dewey, Jr.
GS, GE, TR

EATON MFG. CO.
739 E. 140th St., Cleveland 10, O. (Tel. GLenville 1-5600)
Dir.-Purch.: H. A. Williams
Dir.-Sales: R. E. Fisher
MF, WN, PS, GS, GH, GE

EATON MFG. CO., INC., FREDRIC FLADER DIV.
583 Division St., N. Tonawanda, N. Y. (Tel. LUdlow 5000)
Purch. Agent: Wm. Surgot
Contracts Mgr.: C. W. Hunter
MF, WN, PS, GS, TS, TR

EBERT ELECTRONICS CORP.
212-26 Jamaica Ave., Queens Village 28, N. Y. (Tel. SPruce 6-1800)
Sales Mgr.: V. Horowitz GE, TS, TR

★ECKOL PACKAGING CO.
3001 W. Columbia Ave., Philadelphia 21, Pa. (Tel. STevenson 7-6172)
Purch. Agent: Edwin Stoebenau
Sales Mgr.: Herbert R. Locke
★(See advertisement in this issue)

ECLIPSE-PIONEER DIV., BENDIX AVIATION CORP.
Teterboro, N. J. (Tel. ATlas 8-2000)
Dir.-Purch.: J. Quinn
Purch. Agents: Paul Farley & R. E. Rosemund
Dir.-Sales & Serv.: J. P. Buckley

ECO ENGRG. CO.
12 New York Ave., Newark 1, N. J. (Tel. MArket 4-6565)
Purch. Agent: Vernon Davis
Sales Mgr.: James Eisenberg
MF, PS, GH

ECONOWELD CORP.
519 Hunter Ave., Dayton, O. (Tel. BAldwin 3-7295)
V. P.-Purch.: Bart Wilgus
Engr. Sales: C. A. Thomas GS, GH

EDCLIFF INSTRUMENTS
1711 S. Mountain Ave., Monrovia, Calif. (Tel. RY 1-5671)
Purch. Agent: John Smith
Gen. Sales Mgr.: H. A. Nielsen
GE, CO, TS, TR

EDDINGTON METAL SPECIALTY CO.
Bristol Pike, Eddington, Pa. (Tel. MErcury 9-3600; ORchard 3-8383)
Purch. Agents: Walter V. Czarnecki, Jr., Casimer M. Czarnecki, Wesley Czarnecki, Stanley Czarnecki
Asst. Purch. Agent: Kenneth Leatherman
Engr.-Sales: John J. Intintolo
MF, WN, PS

EDGERTON, GERMESHAUSEN & GRIER, INC.
160 Brookline Ave., Boston 15, Mass. (Tel. COpley 7-3520)
Dir.-Sales: R. L. Purrington
MF, GS, GE, CO, TS, TR

EDER INSTRUMENT CO. INC.
2293 N. Clybourn Ave., Chicago 14, Ill. (Tel. EAstgate 7-2131)
Sales: A. C. Graf

EDGEWATER STEEL CO.
Box 478, Pittsburgh 30, Pa. (Tel. OAkmont 280)
Purch. Agent: L. W. Engel
Asst. Purch. Agent: W. Schano
Gen. Mgr.-Sales: W. M. Cree MF

EDIN CO., INC.
207 Main St., Worcester, Mass. (Tel. PLeasant 7-8394)
Prod. Mgr.: Robert Wadman
MF, PS, CO, TS, TR

THOMAS A. EDISON IND., INSTRUMENT DIV.-McGRAW-EDISON CO.
85 Lakeside Ave., W. Orange, N. J. (Tel. ORange 3-6800)
Purch. Agent: V. Meade
Asst. Purch. Agent: Alex N. Tellschak
Purch.: Harry Keirnan, Richard A. Brennan & Thomas M. Callahan
Gen. Sales Mgr.: George J. Bindewald
PS, GS, GE, CO, TS, TR

EDMUND SCIENTIFIC CO.
101 E. Gloucester Pike, Barrington, N. J. (Tel. LIncoln 7-3488)
Pres.: Norman W. Edmund

EICOR DIV.-F. L. JACOBS CO.
4235 W. North Ave., Chicago, Ill. (Tel. HUmbolt 6-2060)
Purch. Agent: R. Farneti, 517 W. Walnut St., Oglesby, Ill. (Tel. 3-8453)

EIDSON ELECTRONIC CO.
1902 N. Third St., Temple, Tex. (Tel. PR 3-3901) GS, TR

EISLER ENGRG. CO., INC.
750 S. 13th St., Newark 3, N. J. (Tel. BIgelow 3-5310)
Pres.: Charles Eisler, Jr.

EITEL-McCULLOUGH, INC.
San Bruno, Calif. (Tel. JUno 8-1212)
Mgr.-Proc.: John Stenson
Dir.-Mktg.: Hank Brown
Mgr.-Govt. Mktg.: H. M. Bailey
Mgr.-Comm. Mktg.: Robert T. Plummer
GE, TR

ELASTIC STOP NUT CORP. OF AMERICA
2330 Vauxhall Rd., Union, N. J. (Tel. MUrdock 6-6000)
Purch. Agent: Everett F. Howell
Gen. Sales Mgr.: D. E. Lally
MF, PS, GS

ELCO CORP.
"M" St. Below Erie Ave., Philadelphia 24, Pa. (Tel. CUmberland 9-5500)
Purch. Agent: Henry Marks
V. P.-Sales: Leo Kagan
PS, GS, GH, GE, CO, TS, TR

ELDEMA CORP.
1805 Belcroft Ave., El Monte, Calif. (Tel. GIlbert 4-7077)
V. P.-Purch.: Paul W. Redel
Buyer: George Harper
V. P.-Sales: Henry Doeleman TS, TR

ELDORADO ELECTRONICS
2821 10th St., Berkeley, Calif. (Tel. THornwall 1-4613)
Purch. Agent: A. E. Cummins
Sales Mgr.: J. H. Werlin
GE, CO, TS, TR

ELECTRA MFG. CO.
4051 Broadway, Kansas City, Mo. (Tel. WEstport 1-6864)
Purch. Agent: D. E. Aitken
Buyer: J. Gaily GE

ELECTRALAB INC.
Industrial Ctr., Needham Hts., Mass. (Tel. HIllcrest 4-5000)
Purch. Agent: H. Vaughn
Materials Control: K. B. Lorey
V. P.-Sales: A. R. Hughes GE, TR

CODING	
Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

ELECTRIC AUTO-LITE CO., THE
1201 Champlain St., Toledo 1, O. (Tel. CHerry 3-3131)
Mgr.-Govt. Sales Div.: J. C. Kuchers

ELECTRIC AUTO-LITE CO., THE, WIRE & CABLE DIV.
3529 24th St., Port Huron, Mich. (Tel. YUkon 5-6131)
Purch. Agent: A. L. Bailey
Gen. Sales Mgr.: D. M. Skirving
PS, GS, GH, GE, CO, TR

ELECTRIC DESIGN & MFG. CO.
722 Jefferson St., Burlington. Iowa (Tel. PLaza 2-7685)
V. P.: Paul Bartlett
Pres.: Fred Bulmahn

ELECTRIC EYE EQUIPMENT CO.
1930 E. Fairchild St. Danville Ill. (Tel. 2000)
Dir.-Purch.: Floyd Jarling
V. P.-Sales: W. J. Bishop

ELECTRIC HOSE & RUBBER CO.
Wilmington, Del. (Tel. OLympia 5-6261)
Purch. Agent: S. M. Howard
Sales Mgr.: V. W. Wells **PS, GS**

ELECTRIC INDICATOR CO. INC.
Camp Ave., Stamford, Conn. (Tel. DAvis 2-1671)
Purch. Agent: A. J. Gibson Jr.
V. P.-Sales: J. L. Knight
PS, GS, GH, GE, TS, TR

ELECTRIC MOTORS & SPECIALTIES, INC.
King & Hamsher Sts., Garrett, Ind. (Tel. 613)
Purch.: M. Bryant
Sales: J. A. Fuhrman **TS**

ELECTRIC PARTS CORP.
P. O. Box 234, Georgetown, Ky. (Tel. 1600)
Purch. Mgr.: John A. Hawkins
Asst. Purch. Mgr.: George Bland
Sales Mgr.: J. R. Webber
MF, PS, GS, GH, GE, TS, TR

ELECTRIC POWER DOOR CO., INC.
2127 E. Lake St., Minneapolis 7, Minn. (Tel. PArkway 2-6685)
Purch. Agent: Claire E. Landskov
Sales Mgr.: Sherm Kleckner **MF**

ELECTRIC PRODUCTS CO., THE
1725 Clarkstone Rd., Cleveland 12, Ohio (Tel. IVanhoe 1-1500)
Secy-Treas.: Robert J. Berry
Mgr.-Special Prod. Div.: Harvey B. Wilgus
PS, GS

ELECTRIC REGULATOR CORP.
Pearl St., Norwalk, Conn. (Tel. VI 7-2401)
Purch. Agent: E. Aaronson
Sales Mgr.: W. H. Walter
PS, GS, GE, TR

ELECTRIC STEEL FOUNDRY CO.
2141 N. W. 25th St., Portland 10, Ore. (Tel. CApital 8-2141)
Purch. Agent: Marvin E. Price
MF, PS, GS

ELECTRICAL INDUSTRIES, DIV.-PHILIPS ELECTRONICS, INC.
691 Central Ave., Murray Hill N. J. (Tel. CRestview 7-4300)
Purch.: Clarence Graham, Nicholas Perna, and Risley Marsh
V. P.-Sales: Peter Muto
MF, PS, GS, GE, TR

ELECTRICAL & MECHANICAL DESIGN CO.
P. O. Box 706, Clark, N. J. (Tel. FUlton 8-3381)
Purch. & Sales: Raymond E. Hall

ELECTRICAL REFRACTORIES CO., THE
East End, East Clark St., East Palestine, O. (Tel. GArden 6-9433)
Plant Supt.: Hector B. Moore
MF, WN, PS, GE, TS, TR

ELECTRICAL WINDINGS, INC.
2015 N. Kolmar Ave., Chicago, Ill. (Tel. BElmont 5-3360)
Purch. Agent: Arnold M. Topper
Sales Mgr.: L. C. Kammerer
GS, GE, TS, TR

ELECTRO DEVELOPMENT CO.
14701 Keswick St., Van Nuys, Calif. (Tel. STate 6-3660)
Purch. Agent: M. Fishbein
Sales Mgr.: R. Vaccarello **MF, GE**

ELECTRO DEVELOPMENT CORP.
3939 University Way, Seattle 5, Wash. (Tel. MElrose 3-3094)
Pres.: Raymond A. Glaser
V. P.: Gerald Weinstein
Senior Engr.: Max E. Gellert **RE**

ELECTRO ENGRG. WORKS
401 Preda St., San Leandro, Calif. (Tel. LO 9-3326)
Purch. Agent: Marvin C. Phillips
Sr. Buyer: Miss Lois C. Crigler
Sales Mgr.: Rex E. Brooks
GS, GE, CO, TS, TR

ELECTRO IMPULSE LAB., INC.
208 River St., Red Bank, N. J. (Tel. SHadyside 1-0404)
Pres.: Irving Rubin
GS, GE, CO, TS, TR

ELECTRO INSTRUMENTS, INC.
3540 Aero Ct., San Diego 11, Calif. (Tel. BRowning 7-6590)
Purch. Agent: Robert Sammon
Engr. Buyer: James Tibbetts
V. P.-Sales: Walter H. East
CO, TS, TR

ELECTRO PRODUCTS LABS., INC.
4501 N. Ravenswood Ave., Chicago 40, Ill. (Tel. LOngbeach 1-1707)
Purch. Agent: E. V. Tetzner
Sales Mgr.: Richard C. Crossley
GS, CO, TS, TR

ELECTRO TEC CORP.
4 Romanelli Ave., South Hackensack, N. J. (Tel. HUbbard 7-4940)
Purch. Agent: H. Frank
V. P.-Sales: F. F. Sylvester

ELECTRO TEC CORP., VIRGINIA DIV.
P. O. Box 219, Blacksburg, Va. (Tel. PRescott 2-8208)
Purch. Agent: Thomas F. Mantz
Sales Coordinator: Fred Sylvester, South Hackensack, N. J. (Tel. HUbbard 7-4940) **MF, PS, GE, TR**

ELECTRO-CAPACITORS CO., INC.
10132 Edes Ave., Oakland 3, Calif. (Tel. LOckhaven 8-7910)
Sales Mgr.: H. Marquess **GE, TR**

ELECTRODATA DIV.-BURROUGHS CORP.
460 Sierra Madre Villa, Pasadena, Calif. (Tel. SYcamore 3-6121)
Mgr.-Materiel Dept.: W. B. Wight
Mgr.-Sales Dept.: R. G. Dee **GE, TR**

ELECTROFILM, INC.
7116 Laurel Canyon Blvd., P. O. Box 106, N. Hollywood, Calif. (Tel. POplar 5-4420)
Purch. Agent: Dominic Rossi
Gen. & Sales Mgr.: J. A. Droege
MF, WN, PS, GS

ELECTRO-FLEX HEAT, INC.
83 Woodbine St., Hartford 6, Conn. (Tel. CHapel 6-5413)
Purch. Agent: Elizabeth S. Stachel
V. P.-Purch.: Harold C. Davis. Jr.
Sales: Ronald J. Borrup
WN, PS, GS, GE, TR

★ELECTROL INC.
85 Grand St., Kingston, N. Y. (Tel. FEderal 1-1980)
Purch. Agent: L. Edwards
V. P.-Mktg.: R. L. Firth
MF, WN, PS, GS, GE, TS, TR
★(See advertisement in this issue)

ELECTROMATH CORP.
42-14 Greenpoint Ave., Long Island City 4, N. Y. (Tel. STillwell 4-3483)
Purch. Agent: Ralph Pellet
Asst. Purch. Agent: Frank G. Taylor
V. P.-Sales: Thomas A. D. Canova **GE**

ELECTROMATION CO.
1646 18th St., Santa Monica Calif. (Tel. TExas 0-6401)
Mgr.-Purch.: G. B. Blackwell
Prod. Mgr.: R. L. Lane
Chief Engr.: Robert Watts
Engr.-Sales: H. L. Powell
GS, GH, GE, TS, TR

ELECTRO-MEASUREMENTS INC.
7524 S. W. Macadam, Portland 1, Ore. (Tel. CHerry 6-3332)
Purch. Agent: L. R. Rockwood
Asst. Purch. Agent: Lloyd Smith
Sales Mgr.: L. A. Morin
GE, CO, TS, TR

ELECTRO-MEC LAB. INC.
47-51 33rd St., Long Island City 1, N. Y. (Tel. STillwell 6-3402)
Purch. Agent: Leo F. Ostar
Sales Mgr.: Forbes Morse
GE, TS, TR

ELECTRO-MECHANICAL SPECIALTIES CO., INC.
1016 N. Highland Ave., Los Angeles. Calif. (Tel. HOllywood 2-0793)
Purch. Agent: Kenneth Lautman
Gen. Mgr.: James Goodman **GE**

ELECTRO-MEDICAL LAB., INC.
South Woodstock 25, Vt. (Tel. WOodstock 144M4)
Dir.-Purch.: Lovett Garceau
Sales: D. S. Garceau **GE, TS, TR**

ELECTRO-MINIATURES CORP.
1060 Elm Ave., Ridgefield, N. J. (Tel. WHitney 3-7300)
Purch. Agent: L. O. Silvan
Sales Mgr.: L. R. Sonders
GH, GE, TR

ELECTROMODE, DIV.-COMMERCIAL CONTROLS CORP.
570 Culver Rd., Rochester 3, N. Y. (Tel. BUtler 8-1880)
Gen. Sales Mgr.: Paul D. Hawkins
PS, GS

ELECTRON PRODUCTS INC.
430 N. Halstead, Pasadena, Calif. (Tel. RYan 1-0666)
Purch. Agent: F. S. Pirrie
Sales: R. F. Hastings
MF, PS, GS, GE

ELECTRONIC ASSEMBLY CO., INC.
5 Prescott St., Roxbury 19, Mass. (Tel. HI 5-7585)
Purch. Agent: S. Buchbinder
GS, GH, GE, CO, TS, TR

ELECTRONIC ASSOCIATES, INC.
Long Branch, N. J. (Tel. CApital 9-1100)
Purch. Agent: E. F. Van Pelt
Sr. Buyers: L. W. Cavalier, J. H. Schachter, and J. W. Thompson
Buyers: R. A. Grammer and E. Valente
GE, CO, TS, TR

ELECTRONIC COMMUNICATIONS, INC.
1501 72nd St., N., St. Petersburg, Fla. (Tel. DIckens 5-9301)
Purch. Mgr.: R. B. Walworth, Maritime

Base, P. O. Box 359, St. Petersburg, Fla. (Tel. 5-7111)
Purch. Agent: Wesley Magwood, Maritime Base
Buyer-Suprvsr.: George Doescher, Maritime Base
Gen. Sales Mgr.: M. C. Eliason
WN, PS, GS, GE, CO, TS, TR

ELECTRONIC CONTROL CORP.
1573 E. Forest Ave., Detroit 7, Mich. (Tel. TEmple 2-6625)
V. P.-Sales: Stephen V. Hart

ELECTRONIC ENGRG. CO. OF CALIFORNIA
1601 E. Chestnut St., Santa Ana, Calif. (Tel. KImberly 7-5501)
Purch. Agent: A. R. Harman
Buyers: Dale Habberstad & Gene Frake
Asst. Buyer: Steve Gandolpho
Sales Mgr.: W. R. McQuiston
GS, GH, GE, CO, TS, TR

ELECTRONIC FABRICATORS, INC.
682 Broadway, New York 12, N. Y. (Tel. SPring 7-4900)
Pres.: M. Samuels

ELECTRONIC INSTRUMENTATION CO., DIV.-RAMO-WOOLDRIDGE CORP.
4800 Ramo-Wooldridge Rd., P. O. Box 8405, Denver 10, Colo. (Tel. PYramid 4-4311)
Material Mgr.: Fred LaRiviere
Buyers: John O. Jancef, Gino Leonetti, Les Ortman, and Marshall Z. Williams
Mgr.-Mktg.: J. W. Gillon

ELECTRONIC MEASUREMENTS CO., INC.
Lewis St. & Maple Ave., Eatontown, N. J. (Tel. 3-0300)
Purch. Agent: B. DeBlasio
Buyer: Mrs. Doris Shultz
Expeditor: Mrs. Edith Walsh
Sales Mgr.: Douglas Stevens
GS, GE, TR

ELECTRONIC MEASUREMENTS CORP.
625 Broadway, New York 12, N. Y. (Tel. GRamercy 5-0610)
Purch. Agent: L. Stans
Sales Mgr.: M. Lieblich
PS, GS, GH, GE, CO, TS, TR

ELECTRONIC MECHANICS, INC.
101 Clifton Blvd., Clifton, N. J. (Tel. GRegory 3-4108)
Comptroller: N. E. Brown
Gen. Sales Mgr.: J. E. Nester
MF, WN, PS, GE, CO

ELECTRONIC PROCESSES CORP. OF CALIFORNIA
2190 Folsom St., San Francisco 10, Calif. (Tel. UNderhill 1-9595)
Chief Engr.-Purch.: E. H. Stewart, Jr.
Sales Mgr.: A. F. Hogland
PS, GE, CO, TS, TR

ELECTRONIC TECHNIQUES, INC.
13761 Saticoy St., Van Nuys, Calif. (Tel. STate 2-8342)
Dir.-Mktg.: Howard Golden
Sales Mgr.: Val S. Scoville
MF, WN, PS, GS, GH, GE, CO, TS, TR

ELECTRONIC TRANSFORMER CO., INC.
70 Washington St., Brooklyn 1, N. Y. (Tel. MAin 5-6123)
Purch. Agent: Irv Fields
Sales Mgr.: Hal Borgen
GS, GE, TS, TR

ELECTRONICS CORP. OF AMERICA
One Memorial Dr., Cambridge, Mass. (Tel. UN 4-8000)
Dir.-Operations, Mil. Div., & Head-Sales: E. Beaupre
MF, WN, PS, GS, GE, CO, TS, TR

ELECTRONICS DEPT., HAMILTON STANDARD DIV., UNITED AIRCRAFT CORP.
Broad Brook, Conn. (Tel. NAtional 3-1621)
Purch. Agent: K. Williams
Sales Mgr.: Boone T. Guyton
MF, WN, PS, GS, GH, GE, CO, TS, TR

ELECTRONICS DEVELOPMENT CO., INC.
3743 Cahuenga Blvd., N. Hollywood, Calif. (Tel. STanley 7-3223)
Gen. Mgr.: D. W. Baisch
Sales: F. P. Leaming TR

ELECTRONICS DIV., AMERICAN MACHINE & FOUNDRY CO.
1085 Commonwealth Ave., Boston 15, Mass. (Tel. ALgonquin 4-4234)
Dir.-Materiel: P. Goldstein

ELECTRONICS INTERNATIONAL CO.
145 W. Magnolia Blvd., Burbank, Calif. (Tel. VIctoria 9-2481)
Purch. Agent: Merrill Stuart
Sales Mgr.: William Gammon
GE, CO

ELECTRON-RADAR PRODUCTS
4806 W. Chicago Ave., Chicago 51, Ill. (Tel. EStebrook 9-1232)
Purch. Agent: W. A. Bailey
Head-Sales: J. J. Bailey
GS, GH, GE, CO, TS, TR

ELECTRO-PULSE, INC.
11861 Teale St., Culver City, Calif. (Tel. TExas 0-8006)
Purch. Agent: Mrs. Sydelle Green
Sales Mgr.: J. E. Niebuhr
GS, GE, CO, TS

ELECTROSOLIDS CORP.
7436 Varna Ave., N. Hollywood, Calif. (Tel. POplar 5-9716)
Purch. Agent: B. M. Hoffer
Sales Mgr.: Gerald J. Widawsky

ELECTRO-SWITCH & CONTROLS, INC.
5755 Camille Ave., Culver City, Calif. (Tel. TExas 0-4643)
Gen. & Sales Mgr.: J. K. Brose TR

ELECTRO-TECH EQUIPMENT CO.
308 Canal St., New York 13, N. Y. (Tel. WO 6-2350)
Purch. Agent: Milton Brinin
Expediting & Delivery: Marty Jackins
Gen. Mgr.-Sales: Arthur Prince
GS, GE, CO, TS, TR

ELECTRO-WINDERS CO. INC.
854 W. Front St., Covina, Calif. (Tel. EDgewood 2-6207)
Plt. Mgr.-Purch. Agent: George Payne
Asst. Purch. Agent: Lee Goldstein
Sales Mgr.: Jack Ratner

ELEKTRO-SERV CO.
480 Johnson Ave., Brooklyn 37, N. Y. (Tel. HY 7-0053)
Prod. Mgr.: H. S. Rosenblatt
Chief Engr.-Sales: M. Lindner
MF, WN, PS, GS, GE, TR

ELGEET OPTICAL CO., INC.
838 Smith St., Rochester, N. Y. (Tel. BEverly 5-8080)
Purch. Agent: S. J. Rayburn TR

ELGIN MICRONICS, WEST COAST DIV.-ELGIN NATIONAL WATCH CO.
21001 Nordhoff St., Chatsworth, Calif. (Tel. DIamond 0-7220)
Purch. Agent: S. Lieberman
Buyer: H. Haun
Mgr.-Cust. Rel.: J. A. Sellers
MF, WN, PS, GS, GH, GE, CO, TS, TR

ELGIN NATIONAL WATCH CO.
107 National St., Elgin, Ill. (Tel. SHerwood 2-3300)
Dir.-Purch., Watch Div.: W. H. Miller
Gen. Sales Mgr., Watch Div.: Harold Rich
WN, PS, GS, GH, GE, CO, TR

ELJAY CORP.
2908 Herbert St., Baltimore 16, Md. (Tel. WIlkens 5-2903)
Purch. Mgr.: Stanley A. Sladek
MF, WN, PS, GE, TS, TR

B. W. ELLIOTT MFG. CO., INC.
221 Prospect Ave., Binghamton, N. Y. (Tel. 4-2512
Purch.: E. M. Twining PS

ELLIS & WATTS PRODUCTS, INC.
Monroe at Spencer, Cincinnati 36, O. (Tel. SYcamore 1-1725)
Adminis. Supvsr.: Robert J. Lammert
Purch. Agent: James Macke
V. P.-Sales: Robert H. Watts
MF, PS, GS, GH, GE, TR

ELLISON DRAFT GAGE CO.
548 W. Monroe St., Chicago 6, Ill. (Tel. RAndolph 6-2296)
Pres.: Martin Coco
PS, GS, GH, GE, CO, TS

ELM MFG. CO. INC.
10 Washington Ave., Hastings-on-Hudson, N. Y. (Tel. DObbs Ferry 3-7770)
Purch. Agent: S. Arnold
Chief Engr.: M. Brownshield
Prod. Engr.: L. Lane

ELMET DIV.-NORTH AMERICAN PHILIPS CO., INC.
Lisbon Rd., Lewiston, Me. (Tel. 4-5478)
V. P.-Purch., Elmet Div.: R. Lowit
Sales, Elmet Div.: D. R. Donovan
MF, PS, GS, TR

EMELOID CO. INC., THE
1239 Central Ave., Hillside 5, N. J. (Tel. ELizabeth 2-1944)
Purch. Agent: F. M. Headley
Sales Mgr.: George W. Emerson
MF, GE, CO, TR

EMERSON & CUMING, INC.
869 Washington St., Canton, Mass. (Tel. CAnton 6-1066)
Purch. Agent: C. B. McSorley
Sales: E. W. Anderson
MF, WN, PS, GE, TR

EMERSON ELECTRIC MFG. CO., THE, ELECTRONICS & AVIONICS DIVS.
8100 Florissant Ave., St. Louis 21, Mo. (Tel. COlfax 1-1800)
Dir.-Purch.: John A. Alles, 59th & Industrial Aves., Washington Park, Ill. (Tel. Station 850)

Purch. Agent: M. Randall, Washington Park (Tel. Station 852)
Asst. V. P.-Sales: C. G. Gulledge, Washington Park (Tel. Station 270)
MF, WN, GS, GE, CO, TS, TR

EMERSON PLASTICS CORP.
1383 Seabury Ave., Bronx 61, N. Y. (Tel. SYcamore 2-4400)
Purch. Agent: D. Singer
MF, WN, PS, GS, GE, CO, TS, TR

EMHART MFG. CO., SKYWORKER DIV.
83 Ford St., Milford, Conn. (Tel. TRinity 8-0641)
Prod. Co-ordinator: Leslie S. Bailey
Gen. Sales Mgr.: Stephen B. Doss

EMMERT MFG. CO.
Waynesboro, Pa. (Tel. 848)
Gen. Mgr.: R. H. Ziegenfuss
Sales Mgr.: H. O. Atwood GS

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

EMPIRE ELECTRONICS CO., INC.
166 River St., Paterson 1, N. J. (Tel. ARmory 4-8282)
V. P.: George Surasky
PS, GS, GH, GE, TS, TR

EMPIRE PRODUCTS SALES CORP.
37 Prospect St., Amsterdam, N. Y. (Tel. VIctor 2-8400)
Purch.: Frederick G. Lotz
Sales: Michael T. Harges
GE, CO, TS, TR

EMPIRE STATE ALUMINUM CORP.
15 Boston St., Newark 3, N. J. (Tel. MArket 2-3150)
Secy.: Edward Fielding **MF, PS, GH**

ENDEVCO CORP.
161 E. California St., Pasadena, Calif. (Tel. RYan 1 5231)
Prod. Mgr.: John Daly
Buyer: Alex Zielinski
Chief Quality Control Engr.: Tom Woodard
Chief Engr.: Bernie Shoor
Sales Mgr.: Warren Hancock
MF, GS, GE, CO, TS, TR

ENDICOTT FORGING & MFG. CO., INC.
1901 North St., Endicott, N. Y. (Tel. 5-3331)
Gen. Sales Mgr.: A. L. Coleman
MF, WN, PS

ENFLO CORP.
Fellowship Rd. & Rt. 73, Maple Shade, N. J. (Tel. NOrmandy 3-1700)
Purch.: M. A. Rudner
Sales: V. F. Hart
MF, WN, PS, GH, GE, TS

ENGELBERG HULLER CO., INC.
831 W. Fayette St., Syracuse 4, N. Y. (Tel. GR 8-3195)
Purch. Agent: A. Vespa
MF, PS, GS, TS, GE

ENGELHARD INDUSTRIES INC., D. E. MAKEPEACE DIV.
Pine & Dunham Sts., Attleboro, Mass. (Tel. 2-0089)
Purch. Agent-Main Div.: George Aucoin
Purch. Agent-Slip Ring Assm. Div.: Everett Hall
V. P.-Sales: W. F. Mittendorf
MF, WN, PS, GE, TS, TR

ENGINEERED MAGNETICS, DIV.-GULTON INDUSTRIES, INC.
13030 Cerise Ave., Hawthorne, Calif. (Tel. ORegon 8-7608)
Purch. Agent: Don Wills
Buyer: Art Corralos **PS, GS, GE, TR**

ENGINEERED PLASTICS, INC.
Chase St., Gibsonville, N. C. (Tel. 2411)
Purch. Agent: C. V. Long, Jr.
Sales Mgr.: C. H. Phillips
MF, PS, GE, TR

ENGINEERED PRODUCTS CO., THE
129 Smith St., Flint, Mich. (Tel. CE 9-8689)
Purch. Agent: S. G. Both
Sales Mgr.: H. Scott
MF, WN, PS, GS, GH, GE

ENGRG. CORP. OF AMERICA
5111 Santa Monica Blvd., Hollywood 29, Calif. (Tel. NOrmandy 4-1961)
Purch. Agent & Head-Sales: Vernon W. Haas

ENGRG. DEVELOPMENTS, INC.
P. O. Box 149, Newport, R. I. (Tel. Viking 6-9100)
Purch. Agent: Dana Mulholland
Sales Mgr.: E. J. Lass

ENGIS EQUIPMENT CO.
431 S. Dearborn St., Chicago 5, Ill. (Tel. HArrison 7-3223)
Purch. Dept.: Mrs. C. L. Morton
V. P.: E. J. Schneider
GS, GE, CO, TS, TR

ENTERPRISE TOOL & GEAR CORP.
8320 E. McNichols Rd., Detroit 34, Mich. (Tel. TW 1-5780)
Purch. Agent: Bruce F. Rogers
Sales Mgr.: George R. Alschbach

ENTRON, INC.
4902 Lawrence St., P. O. Box 287, Bladensburg, Md. (Tel. APpleton 7-9585)
Purch. Agent: Carl D. Jones
V. P.-Sales: Robert McGheehan

ENVIRONMENTAL EQUIPMENT CO.
369 Linden St., Brooklyn 27, N. Y. (Tel. HEgeman 3-9872)
Purch. Agent: V. Batalin
Chief Engr.-Purch.: A. Hershey
Asst. Engr.-Purch.: Louis Gold
Head-Sales: L. W. McDaniel **GS, TS**

EPCO PRODUCTS INC.
2500 Atlantic Ave., Brooklyn 7, N. Y. (Tel. DIckens 5-7531)
V. P.-Sales: Al Osborne **GE**

EPIC, INC.
154 Nassau St., New York 38, N. Y. (Tel. DIgby 9-2470)
Head-Purch. Dept.: D. Nicolitch
Head-Sales: Peter Letica
GS, GE, TS, TR

EPOXY PRODUCTS, INC., DIV.-JOSEPH WALDMAN & SONS
133 Coit St., Irvington, N. J. (Tel. ESsex 5-6000)
Purch. Agent: Edward Sagerman
MF, WN, PS, GE

EPSCO INC.
588 Commonwealth Ave., Boston 15, Mass. (Tel. COpley 7-8100)
Purch. Dir.: George R. Herring
Buyer: Robert R. Doucette
Expediter: Richard A. Nichols
GS, GE, CO, TS, TR

ERASER CO., INC., THE
1068 S. Clinton St., Syracuse 4, N. Y. (Tel. GR 6-7441)
Purch. Agent: Joseph F. Muhl

ERDCO ENGRG. CORP.
Addison, Ill. (Tel. KIngswood 3-6733)
Purch. Agent: William E. Huntsha
Sales Mgr.: Milton H. Goemann **PS**

ERIE RESISTOR CORP.
644 Wizth, Erie, Pa. (Tel. 2-1481)
Purch. Agent: George T. Griswold
Buyer-Equip.: Roger Lusk
Buyer-Electronics Div.: Paul Harkness
Buyer-Electromechanical Div.: Carol Mikoda
Buyer-Plastics Div.: Edward Torok
V. P.-Mktg.: Allen K. Shenk
MF, WN, PS, GS, GE, CO, TS, TR

ERIEZ MFG. CO.
1945 Grove Dr., Erie, Pa. (Tel. 4-0133)
Purch. Agent: G. A. Amidon
Mktg. Mgr.: R. A. Roosevelt
GS, GH, TS

ERWOOD INC.
1770 W. Berteau Ave., Chicago 13, Ill. (Tel. BIttersweet 8-0622)
Purch. Agent: E. L. Grant
PS, GS, GE, TS, TR

ESCAMBIA CHEMICAL CORP.
261 Madison Ave., New York 16, N. Y. (Tel. OX 7-4315)
Purch. Agent: G. F. Jones, P. O. Box 467, Pensacola, Fla. (Tel. Milton, Fla.—2293)
Pres.: R. U. Haslanger **PS**

ESS INSTRUMENT CO.
96 S. Washington Ave., Bergenfield, N. J. (Tel. DUmont 4-3411)
Purch. Agent: H. Sarube
V. P.-Purch.: R. W. Heimsoth
Sales Mgr.: Eugene Ross
PS, GH, CO, TS, TR

ESSEX MFG. CO., INC.
8213 Gravois, St. Louis 23, Mo. (Tel. VErnon 2-4500)
Purch. Agent: Harold Guller
Dir.-Sales: Don Hill
MF, PS, GS, GH, GE, TS

ESSEX WIRE CORP.
1601 Wall St., Fort Wayne, Ind. (Tel. E-0311)
Purch.: G. Brown **MF, PS, GS, TR**

ESSEX WIRE CORP., MAGNET WIRE DIV.
1601 Wall St., Ft. Wayne, Ind. (Tel. EAstbrook 0311)
Magnet Wire Purch. Agent: G. Kohlmeier
Sales: J. W. Stewart **MF, TR**

ESSO STANDARD OIL CO.
15 W. 51st St., New York 19, N. Y. (Tel. PLaza 7-1200)
Gen. Mgr.: A. J. Kelly
V. P.-Sales: B. L. Ray

ETCHED PRODUCTS CORP.
39-01 Queens Blvd., Long Island City 4, N. Y. (Tel. STilwell 4-5900)
Purch. Agent: Jack Grosswald
V. P.-Purch.: Leonard D. Kiechel
MF, PS, GE, CO, TS, TR

EWALD INSTRUMENTS
Rt. 7-G, Kent, Conn. (Tel. WAlker 7-3278)
CO, TS

EXACT ENGRG. & MFG. INC.
2375 Canyon Dr., P. O. Box 668, Oceanside, Calif. (Tel. SAratoga 2-8503)
Purch. Agent: Frank Pendleton
Sales Mgr.: Frank J. Berberich
WN, PS, GS, GH, GE, CO, TS, TR

EXACTO INDUSTRIES, INC.
8730-36 Santa Monica Blvd., Los Angeles 46, Calif. (Tel. OLeander 5-7470)
Pres.: Jackson P. Horning
Sales: Mildred Bernard **MF**

EX-CELL-O CORP.
1200 Oakman Blvd., Detroit 32, Mich. (Tel. TOwnsend 8-3900)
Dir.-Purch.: F. D. Sicklesteel
Purch. Agent: F. Grimm
V. P.-Indust. Sales: D. H. McIver
MF, PS, GS, GE

EXCELSIOR LEATHER WASHER MFG. CO. INC.
720-730 Chestnut St., Rockford, Ill. (Tel. 8-2203)
Treas.: W. E. Duclon **MF, PS**

EXECUTONE, INC.
415 Lexington Ave., New York 17, N. Y. (Tel. MUrray Hill 7-7440)
Purch. Agent: Bernard Loew, 47-37 Austell Place, Long Island City 1, N. Y. (Tel. RAvenswood 9-7031)
Natl. Sales Mgr.: Ed Brody
GS, GE, TR

★EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.
42 S. 15th St., Philadelphia 2, Pa. (Tel. LOcust 4-4030)
Purch. Agent: H. S. Stevenson
Sales: C. J. Moore **GS, GH, GE, TS**
★(See advertisement in this issue)

EYELET TOOL CO. INC.
236 Broadway, Cambridge, Mass. (Tel. ELliot 4-4492) **MF, GS, TS**

FABRICATED STEEL SERVICE, INC.
2400 Laurel Canyon Blvd., N. Hollywood, Calif. (Tel. ST 7-1508)
Gen. Mgr.: E. M. Waite
Chief Estimator: William Whiteman
Sales Mgr.: E. U. Davis **MF, GS, GH**

FAIRBANKS CO., THE
393 Lafayette St., New York 3, N. Y. (Tel. SPring 7-8800)
V. P.-Sales: E. T. Flanagan **GS**

SHERMAN FAIRCHILD & ASSOC. INC.
580 Midland Ave., Yonkers, N. Y. (Tel. GReenleaf 6-0201)
Purch. Agent: John Hawes
Sales: Robert D. Shoborg TS, TR

FAIRCHILD CAMERA & INSTRUMENT CORP., INDUSTRIAL CAMERA DIV.
5 Aerial Way, Syosset, N. Y. (Tel. WEIls 1-4500)
Purch. Agent: Wm. Crocker
Mktg. Mgr.: C. Cherry CO, TS, TR

FAIRCHILD CONTROLS CORP., COMPONENTS DIV.
225 Park Ave., Hicksville, L. I., N. Y. (Tel. WEIls 8-5600)
Dir.-Purch.: R. August
Purch. Agent: R. Crockett, 6111 E. Washington Blvd., Los Angeles, Calif. (Tel. RAymond 3-5191)
Mktg. Mgr.: A. A. Budde
PS, GE, CO, TS, TR

FAIRCHILD GUIDED MISSILES DIV., FAIRCHILD ENGINE & AIRPLANE CORP.
Wyandanch, L. I., N. Y. (Tel. MIdland 3-7171)
Gen. Mgr.: Grayson Merrill
Contracts Mgr.: A. W. Doherty MF, GS

FAIRFIELD ENGRG. CO., THE
324 Barnhart, Marion, O. (Tel. 2-2117)
Purch. Agent: H. M. Geyer
V. P.-Sales: W. R. Reichenstein GS

FAIRFIELD ENGINEERING CORP.
934 Hope St., Springdale, Conn. (Tel. DAvis 5-1561)
Sales Mgr.: Michael A. Portanova
PS, GS, GH, GE, CO, TS, TR

FALSTROM CO.
75 Falstrom Ct., Passaic, N. J. (Tel. PRescott 7-0013)
Purch. Agent: P. W. Kievit
Asst. Purch. Agent: R. L. Chapman
Sales & Adv. Mgr.: R. E. Hill
MF, PS, GS, GH, GE

FANSTEEL METALLURGICAL CORP.
North Chicago, Ill. (Tel. DExter 6-4900)
Dir.-Purch.: J. A. Teece
Purch. Agent: G. E. Powell
Buyers: L. W. Carter, W. Laser & E. A. Weidman
Asst. Purch. Agent: G. Conner
MF, WN, PS, GS, GH, GE, CO, TS, TR

FARNSWORTH ELECTRONICS CO., DIV-INT'L TELEPHONE & TELEGRAPH CORP.
Ft. Wayne, Ind. (Tel. EAstbrook 7571)
Dir.-Purch.: R. H. Hauser
Sales: N. S. Underhill RE

JOHN E. FAST & CO.
3526 N. Kedzie Ave., Chicago 18, Ill. (Tel. JUniper 8-2715)
Purch. Agent: J. B. Kelly
Buyer: Harry Janiak GE, TR

FAULTLESS CASTER CORP.
1521 N. Garvin St., Evansville 7, Ind. (Tel. HArrison 5-9041)
V. P.-Purch.: Elmer H. Noelting
Purch. Agent, Parts: Roy C. Lockyear
Purch. Agent, Raw Materials: Richard S. Ferguson
Exec. V. P.-Sales: Clarence B. Noelting
GS

J. W. FECKER, INC., SUB.-AMERICAN OPTICAL CO.
6592 Hamilton Ave., Pittsburgh 6, Pa. (Tel. EM 1-7617)
Purch. Agent: Burt Demarco
Prod. Control Supvr.: Robert H. Vatz
Prod. Supvr.: Robert Kraus
Chief Engr.: Paul T. Kaestner
Proj. Engr.: James Colker
Pres.: Joseph Kalla
GS, GH, GE, CO, TS, TR

FEDERAL BEARINGS CO. INC., THE
Fairview Ave., Poughkeepsie, N. Y. (Tel. GL 2-6000) PS, GS, GE

FEDERAL MACHINE CO. INC.
841 Garfield Ave., Jersey City, N. J. (Tel. Henderson 5-1500)
Purch. Agent: H. Shapiro
Pres.: Harold H. Butler

FEDERAL MACHINE TOOL CO.
626 Dorchester Ave., South Boston 27, Mass. (Tel. ANdrew 8-8380)
Purch. Agent: George W. Kenty
Sales Mgr.: John Garrity

FEDERAL METAL HOSE CORP.
277 Military Rd., Buffalo 7, N. Y. (Tel. DE 4893) MF, PS, GS

FEDERAL PRODUCTS CORP.
1144 Eddy St., Providence 1, R. I. (Tel. STuart 1-9300)
Asst. Adv. Mgr.: G. H. Wilson

FEDERAL SCREW PRODUCTS INC.
3917 N. Kedzie Ave., Chicago 18, Ill. (Tel. IRving 8-5744)
Purch. Agent: Ted Eisman
Sales Mgr.: L. L. Harris
MF, WN, PS, GS, GH, GE

FEDERAL SHOCK MOUNT DIV.-THE KORFUND CO.
1060 Washington Ave., New York 56, N. Y. (Tel. WYandotte 3-0400)
Purch. Agent: S. Kamin
Sales Mgr.: J. I. Hammond
MF, PS, GE

FEDERAL TELEPHONE & RADIO CO.
100 Kingsland Rd., Clifton, N. J. (Tel. NUtley 2-3600)
Purch. Mgr.: H. P. Sommerer
V. P.-Sales: T. M. Douglas

FEEDBACK CONTROLS, INC.
899 Main St., Waltham 54, Mass. (Tel. TWinbrook 4-1020)
Purch. Agent: Stanley W. Block
Sales Mgr.: John J. Fernsler
GE, CO, TS, TR

FEILER ENGRG. & MFG. CO.
8026 N. Monticello Ave., Skokie, Ill. (COrnelia 7-8280)
Purch. Agent: G. Wolf
Asst. Purch. Agent: L. Freedman
Sales Mgr.: Elwood Talan

FENSKE FEDRICK & MILLER INC.
12820 Panama St., Los Angeles 66, Calif. (Tel. TExas 0-6041)
Dir.-Materiel: D. McCullough
V. P.-Sales: J. R. Fedrick
GS, GE, CO, TS, TR

FENWAL INC.
Pleasant St., Ashland, Mass. (Tel. TRinity 5-6111)
Purch. Agent: J. R. Keough
Buyers: J. M. Nichols & J. Mahoney
Purch. Suprvsr.: F. Stockwell
V. P.-Sales: J. M. Storkerson
MF, WN, PS, GS, GE, CO, TS, TR

FERRANTI ELECTRIC INC.
30 Rockefeller Plaza, New York 20, N. Y. (Tel. CIrcle 7-0911)
Purch. Agent: P. C. Pope
GS, GE, TS, TR

L. W. FERDINAND & CO., INC.
2300 Washington St., Newton Lower Falls 62, Mass. (Tel. DEcatur 2-5307)
Head-Purch. Dept.: Miss E. K. Mahan

FERRIS INSTRUMENT CO.
110 Cornelia St., Boonton, N. J. (Tel. DE 4-0781)
Head-Purch. Dept.: Harold E. Barnes
PS, GS, GE, TR

FERROXCUBE CORP. OF AMERICA
129 E. Bridge St., Saugerties, N. Y. (Tel. CHerry 6-2811)
Purch. Agent: H. Martin
Sales Adm.: W. J. Crosby
MF, PS, GS

FIDELITY AMPLIFIER CO.
1633 N. Halsted St., Chicago 14, Ill. (Tel. MOhawk 4-3515)
Purch. Agent: W. Stanton Martin GE

FIDELITY CHEMICAL PRODUCTS CORP.
470 Frelinghuysen Ave., Newark 12, N. J. (Tel. BR 2-4110)
Gen. Mgr.-Purch.: Maurice Bick
Head-Sales: S. B. Lonyai
MF, WN, PS, GS, GH, TR

FIDELITY INSTRUMENT CORP.
1000 E. Boundry Ave., York, Pa. (Tel. 7675)
Purch. Agent: George Dietz
V. P.-Sales: R. P. Nick GS, GE

FILMOHM CORP.
48 W. 25th St., New York 10, N. Y. (Tel. WAtkins 4-9240)
Purch. Agent: Bob Latin
Buyer: M. Rosten
V. P.-Sales: J. N. Popper
GE, TS, TR

FILTORS, INC.
30 Sagamore Hill Dr., Port Washington, N. Y. (Tel. 7-8220)
Purch. Dir.: Dominic Bochicchio
GE, TR

FILTRON CO., INC.
131-15 Fowler Ave., Flushing, N. Y. (Tel. HIckory 5-7000)
Purch.: R. Price & L. Kerestury
Gen. Sales Mgr.: Samuel I. Perry

FINE ORGANICS, INC.
211 E. 19th St., New York 3, N. Y. (Tel. GRamercy 5-1030)
Purch. Agent: Miss Agnes Guidice
Asst. to the Pres.: Emanuel Rosenblat

FINN AERONAUTICAL DIV., T. R. FINN & CO., INC.
275 Goffle Rd., Hawthorne, N. J. (Tel. HA 7-7123)
Purch. Engr.: T. B. Malloy
Asst. Purch. Engr.: Robert Price
MF, PS, GE, CO, TS

FIRESTONE TIRE & RUBBER CO., THE, GUIDED MISSILE DIV.
2525 Firestone Blvd., Los Angeles 54, Calif. (Tel. LUdlow 3-4411)
Purch. Agent-Coast Div.: J. D. Esterly
Mgr., Purch. Dept.-Guided Missile Div.: N. H. Peterson
Sales Engr.: F. W. Thompson

★FIREWEL CO., INC., THE
3685 Broadway, Buffalo 25, N. Y. (Tel. REgent 0440)
Purch. Agent.: A. DiMiceli
Buyer-Expediter: S. Mazurkiewicz
Buyers: R. Salzman & R. Langhans
V. P.-Aviation Products: John C. Goodell
PS

★(See advertisement in this issue)

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

FIRST ELECTRONICS CORP., THE
117 Blue Hill Ave., Boston 19, Mass. (Tel. HI 5-1810)
Purch. Agent: W. Allen
MF, PS, GS, GH, GE, CO, TS, TR

FIRTH STERLING INC.
3113 Forbes, Pittsburgh, Pa. (Tel. MUseum 2-4600)
Purch. Agent: Harry K. Stern, McKeesport, Pa. (Tel. HOmestead 1-4776)
Asst. Purch. Agent: George L. Miller, McKeesport, Pa.
V. P.-Sales: Thomas G. Barnes
MF, WN, PS, GS

FISHER RESEARCH LAB., INC.
1961 University Ave., Palo Alto, Calif. (Tel. DAvenport 2-4646)
Purch. Agent: James G. Rafferty
Sales Mgr.: E. A. Feichtmeir

FISCHER & PORTER CO.
6 Warminster Rd., Hatboro, Pa. (Tel. OSborne 5-6000)
Purch. Agent: Daniel Steelman
V. P.-Sales: Robert L. Rice
MF, PS, GS, GH, GE, CO, TS, TR

FLEXAUST CO., THE
100 Park Ave., New York, N. Y. (Tel. ORegon 9-1300)
Supt.-Purch.: T. Burbank, Chestnut St., Amesbury, Mass. (Tel. 1396)
Sales Mgr.: T. G. May PS, GS, GH

FLEXIBLE METAL HOSE MFG. CO.
777 W. 16th St., Costa Mesa, Calif. (Tel. LIberty 8-6252)
Pres.: Elton Hallett
MF, PS, GS, GH, GE

FLEXONICS CORP.
1414 S. Third St., Maywood, Ill. (Tel. FIllmore 3-8000)
Purch. Agent: M. D. Thackaberry
V. P.-Sales: T. K. Wells MF, PS, GS

FLEXROCK CO.
3609 Filbert St., Philadelphia, Pa. (Tel. BAring 2-5500)
Mech. Engr.-Purch.: H. Schmidt
Sales Mgr.: H. Himbert MF, PS

★FLIGHT RESEARCH, INC.
P. O. Box 1-F, Richmond 1, Va. (Tel. REpublic 7-4163)
Purch. Agent: Wm. J. Waymack, Jr.
V. P. & Gen. Mgr.: Wm. T. Curdts, III
Sales Mgr.: John C. Pennock
WN, PS, GS, GH, GE, TS, TR
★(See advertisement in this issue)

FLOCK PROCESS CO. INC.
375 Main Ave., Norwalk, Conn. (Tel. VIctor 7-4586)
Head-Purch. Dept.: R. J. Leff
Head-Sales: H. A. Leff
MF, PS, GS, TS, TR

FLOW CORP.
85 Mystic St., Arlington 74, Mass. (Tel. MIssion 8-3185)
Admin. Asst.-Purch.: R. J. McIlveen
Mgr.-Sales: H. P. Grant TS

JOHN FLUKE MFG. CO., INC.
1111 W. Nickerson St., Seattle 99, Wash. (Tel. AT 2-5700)
Plant Mgr.: R. M. Nicholas
Sales Mgr.: Robert E. Florence
GS, GE, CO, TS, TR

FLUOROCARBON CO. INC., THE
1206 E. Ash Ave., Fullerton, Calif. (Tel. MAdison 6-2933)
Purch. Agent: J. L. Kreitz
Sales Mgr.: Sandy Poteet
MF, WN, PS, GS

FLUSH WALL RADIO CO.
1012 Cleveland St., Clearwater, Fla. (Tel. 34-6061)
Pres.: L. R. Schenck

FOOD MACHINERY & CHEMICAL CORP.
161 E. 42nd St., New York 17, N. Y. (Tel. MUrray Hill 7-7400)
Purch. Dir.-Chemical Divs.: J. A. Mooney
PS

FOOD MACHINERY & CHEMICAL CORP., ORDNANCE DIV.
1105 Coleman Ave., San Jose, Calif. (Tel. CYpress 4-8124)
Procurement Mgr.: H. L. Hall
Purch. Agent: H. V. Rogers
Asst. Purch. Agent: F. P. Gorentz
Sales: H. R. Hammond
MF, PS, GS, GH, CO, TS

FOOTE BROTHERS GEAR & MACHINE CORP.
4545 S. Western Blvd., Chicago 9, Ill. (Tel. VIrginia 7-4200)
V. P.-Purch.: E. A. Johnson
V. P.-Sales, Precision Div.: I. C. Maust
MF, WN, PS, GS, GE, TS, TR

FOOTE MINERAL CO.
18 W. Chelten Ave., Philadelphia 44, Pa. (Tel. VIctor 8-4000)
Dir.-Purch.: W. M. Raynor
Asst. Dir.-Purch.: W. J. Brooking
Purch. Agent: H. H. Apgar
Gen. Sales Mgr.: James Fentress

GEORGE F. FORBES, INDUSTRIAL MATHEMATICIAN, PUBLISHER
10117 Bartee Ave., Pacoima, Calif. (Tel. EM 9-2132)
Publisher: George F. Forbes

M. A. FORD MFG. CO., INC.
1545 Rockingham St., Davenport, Iowa (Tel. 2-3251)
Secy.: Stanley Hill
Sales Mgr.: L. E. Schumann GS

FORD INSTRUMENT CO., DIV.-SPERRY RAND CORP.
31-10 Thomson Ave., Long Island City 1, N. Y. (Tel. STillwell 4-9000)
Dir.-Procurement: C. Arcularius
V. P.-Sales: A. L. Coulson WN, GS, GE

FOREMAN MFG. CO.
5353 S. State St., Chicago 9, Ill. (Tel. OAkland 4-3606) MF, PS, GS

FORMSPRAG CO.
23601 Hoover Rd., Warren (Detroit), Mich. (Tel. JEfferson 6-5100)
Purch. Agent: E. D. Mackie
Buyer: R. F. Agnelly
V. P.-Sales: Charles F. Trapp, Jr.

FORT HILL PLASTIC LETTERS CORP.
40 Hanover St., Boston 8, Mass. (Tel. RIchmond 2-2570)
V. P.: Oswald W. Gregson

FORT WAYNE METALS, INC.
3211 MacArthur Dr., Ft. Wayne, Ind. (Tel. HArrison 3267)
Comptroller: Frank B. Didier MF, PS

FOUR WHEEL DRIVE AUTO CO., THE
105 E. 12th St., Clintonville, Wisc. (Tel. 2241)
Dir.-Purch.: Lloyd Pinkowsky
Asst. Dir.-Purch.: Leroy Hughes
Mgr.-Ground Support Equip. Div.: Wesley H. Peters GS, GH

THOMAS T. FOX CO.
95 Summit St., Newark, N. J. (Tel. MItchell 2-4323)
Purch.: Michael Fisher & S. Fresco
GE, CO, TS

FRAM CORP.
105 Pawtucket Ave., Providence 16, R. I. (Tel. GEneva 4-7000)
Dir.-Purch.: H. Keough
V. P.-Sales: H. E. Robinson PS, GS

FRANKLIN FIBRE-LAMITEX CORP.
E. 18th St.-on P.R.R. Siding, Wilmington, Del. (Tel. OL 8-5269)
Purch.: A. R. Campbell
MF, WN, PS, GS, GE, TS, TR

FREEMAN CO., THE
8th & Walnut Sts., Yankton, S. Dak. (Tel. 2829)
Purch.: E. W. Freeman
Dir.-Sales: S. H. Byquist
MF, WN, PS, GS, GH, GE, TR

FRENCHTOWN PORCELAIN CO.
Harrison & 8th Sts., Frenchtown, N. J. (Tel. 480)
Prod. Development Engr.: C. L. Seversike
Mgr.-Mktg. & Prod. Development: J. E. Comeforo

FRIEZ INSTRUMENT DIV.-BENDIX AVIATION CORP.
1400 Taylor Ave., Towson 4, Md. (Tel. VAlley 3-4040)
Purch. Agent: H. J. Grady
Mgr.-Special Prods. Sales: R. B. Stevenson
WN, PS, GS, GE, CO, TS, TR

FROMSON ORBAN CO., INC.
261 Madison Ave., New York 16, N. Y. (Tel MUrray Hill 7-0920) MF, PS

★FRUEHAUF TRAILER CO.
10940 Harper Ave., Detroit 32, Mich. (Tel. WAlnut 1-2410)
Dir.-Purch.: B. M. Kirsten
Mgr., Missile Prod. Div.-Sales: E. R. Neumann GS, GH
★(See advertisement in this issue)

FUGLE-MILLER LABS. INC.
Central Ave., Clark, N. J. (Tel. FUlton 1-2727)
Purch. Agent: F. L. Fugle, Jr.
Sales Mgr.: Conrad Miller
GS, GE, TS, TR

FULTON-IRGON CORP., THE
P. O. Box 591, Dover, N. J. (Tel. FOxcroft 6-2940, Ext. 360)
Purch. Agent: R. J. Novotny
Sales Mgr.: David Fulton

FURANE PLASTICS, INC.
4516 Brazil St., Los Angeles 39, Calif. (Tel. CHapman 5-5763)
Purch.: J. Brecker
Sales: Pat B. Smith MF, WN, PS, TR

FUSITE CORP.
6000 Fernview Ave., Cincinnati 13, O. (Tel. REdwood 1-2020)
Purch. Agent: J. Fox
V. P.-Sales: J. H. Marsh, Jr.
MF, PS, GS, GE

FUTURECRAFT CORP.
1717 N. Chico Ave., El Monte, Calif. (Tel. CUmberland 3-2113)
Purch. Agent: Wesley Jones
Buyer: Claude Knight
Prod. Control: Clyde Swinehart
Supt.: Aage Hansen
Chief Test Engr.: Richard Fewell
Sales Mgr.: Robert Burke
MF, PS, GS, GE

G-L ELECTRONICS CO., INC.
2921 Admiral Wilson Blvd., Camden 5, N. J. (Tel. WOodlawn 6-2780)
Purch. Agent: Boyd F. Beatty
Dir.-Sales: Stephen G. Lax PS, TR

G-M LABS. INC.
4300 N. Knox Ave., Chicago 41, Ill. (Tel. PEnsacola 6-1800)
Purch. Agent: Irving M. Temen
Expeditor: Earl Keller
Sales Mgr.: A. G. Bradt GE, TS

GPS INSTRUMENT CO., INC.
180 Needham St., Newton 64, Mass. (Tel. DEcatur 2-8110)
Purch. Agent: Samuel Giser
Sales Mgr.: Strain Sutton GE, TR

G-V CONTROLS INC.
45 Hollywood Plaza, E. Orange, N. J. (Tel. ORange 3-4300)
Gen. Sales Mgr.: Robert F. Stockton GE, TS, TR

GABRIEL CO., THE, GABRIEL ELECTRONICS DIV.
135 Crescent Rd., Needham Heights 94, Mass. (Tel. HIllcrest 4-0005)
Purch. Agent: A. Walker
Asst. Purch. Agent: M. McGlaughlin
Dir.-Engrg. & Sales: Steven Galagan WN, GS, GH, GE, TR

GAERTNER SCIENTIFIC CORP., THE
1262 Wrightwood Ave., Chicago 14, Ill. (Tel. BUckingham 1-5335)
Purch. Agent: L. V. Mosbarger
Sales Mgr.: Lyman W. Higgins MF, PS, GS, GH, GE, CO, TS, TR

GAHAGAN INC.
Waterman Ave., Esmond 17, R. I. (Tel. CEnterdale 1-4000)
Purch. Agent: John Gilligan

GALLAND-HENNING NOPAK DIV.
2750 S. 31st St., Milwaukee 46, Wisc. (Tel. MItchell 5-6000)
Sales Prom. Mgr.: R. G. Patrick GS

G. W. GALLOWAY CO.
220 S. 1st Ave., Arcadia, Calif. (Tel. RYan 1-5676)
Purch. Agent: M. J. Carlow
Asst. Purch. Agent: W. McCormick
V. P.-Sales: M. E. Tait

GAMMONS-HOAGLAND CO., THE
395 Main St., Manchester, Conn. (Tel. MItchell 9-7343)
Secy.: C. A. Hoaglund
Treas.: D. I. Mitchell

GARDNER-DENVER CO.
Front St., Quincy, Ill. (Tel. BAldwin 2-5400)
Purch. Dir.: E. J. Maloney
Gen. Sales Mgr.: G. W. Gutekunst GS, GH

GARDE MFG. CO.
588 Eddy St., Providence 3, R. I. (Tel. UNion 1-0604)
Sales: C. Demurjian MF, WN, PS, GS, GE, TS, TR

GARDNER LABORATORY, INC.
P. O. Box 5728, Bethesda 14, Md. (Tel. OL 6-3600)
Head-Purch. Dept.: W. J. Furmage
Head-Sales: Henry A. Gardner, Jr. TS

GARRETT CORP., THE, AIR CRUISERS DIV.
Rt. 34, Wall Township, N. J. (Tel. MUtual 1-3527)
Purch. Agent: J. V. Caputi
Div. Mgr.-Sales: J. E. Callahan MF, PS

★GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
9851 Sepulveda Blvd., Los Angeles 45, Calif. (Tel. OR 8-9211)
Purch. Mgr., AiResearch Mfg. Div., Los Angeles: Budrick Schindler
Purch. Agent, AiResearch Mfg. Div., Sky Harbor Airport, Phoenix, Ariz.: Leslie H. Rhuart (Tel. BR 5-5431)
Dir.-Proc., The Garrett Corp.: James B. Meyer MF, WN, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

GASKET MFG. CO. INC.
319 W. 17th St., Los Angeles 15, Calif. (Tel. RIchmond 9-4063)
Purch.: C. Lane
Sales: D. W. Goodin MF, WN, PS

GASKET, PACKING & SPECIALTY CO. INC.
41 N. Saxon Ave., Bay Shore, N. J. (Tel. 7-0298)
Purch. Agent: Andrew Young
V. P.-Sales Mgr.: J. B. Lazarus MF, WN, PS, GE, TS, TR

GATES ELECTRONIC CO.
2090 Barnes Ave., New York 62, N. Y. (Tel. TYrone 2-6490)
Purch.: J. Phillips
Sales Engr.: I. Regan TS, TR

GATKE CORP.
248 N. LaSalle St., Chicago 1, Ill. (Tel. STate 2-0081)
Purch. Agent: W. R. Berngen
Buyer: J. Call
V. P.-Sales: F. T. Gatke MF, WN, PS

GEARTRONICS CORP.
50 Nashua St., Woburn, Mass. (Tel. WOburn 2-0390)
Purch. Agent: W. Dobbins
Sales Mgr.: F. H. Kean MF, WN, PS, GS, GE, CO, TS, TR

GEISLER LABS.
P. O. Box 252, Menlo Park, Calif. (Tel. EMerson 8-4127)
Purch. Agent: F. Geisler

GENERAL AUTOMATIC CORP.
12 Carlton Ave., Mountain View, N. J. (Tel. CLifford 6-2756)
Sales Mgr.: Mort D. Barron

GENERAL CABLE CORP.
420 Lexington Ave., New York 17, N. Y. (Tel. LExington 2-2920)
V. P.-Purch.: E. B. McGrew
V. P.-Sales: H. G. Richardson MF, WN, PS, GS, GH, GE, CO, TS, TR

GENERAL CEMENT MFG. CO., DIV.-TEXTRON INC.
400 S. Wyman St., Rockford, Ill. (Tel. 2-6695)
Purch. Agent: George Kampmeier
V. P.-Sales: R. D. Gawne MF, WN, PS, GS, GH, GE

GENERAL CERAMICS CORP.
Keasbey, N. J. (Tel. VAlley 6-5100)
Purch. Agent: E. R. Parsells
Sales Mgr.: J. P. Manley MF, WN, PS, GE, TR

GENERAL CHEMICAL DIV., ALLIED CHEMICAL & DYE CORP.
40 Rector St., New York 6, N. Y. (Tel. HAnover 2-7300) PS

GENERAL COMMUNICATION CO.
681 Beacon St., Boston 15, Mass. (Tel. COpley 7-6030)
Purch. Dir.: J. M. Orsillo
Sales: J. B. Hamre PS, GS, GH, GE, CO, TS, TR

GENERAL COMPONENTS INC.
225 E. 144th St., New York 51, N. Y. (Tel. MOtthaven 5-0740)
Purch. Agent: Michael Meola
Chief Engr.: Sal De Ianni
Sales Mgr.: Henry Meola MF, WN, PS, GS, GH, GE, TR

GENERAL CONTROLS CO.
801 Allen Ave., Glendale 1, Calif. (Tel. VIctoria 9-2181)
Mgr.-Purch. Dept.: M. J. Kouf

GENERAL ELECTRIC CO., APPARATUS SALES DIV.
1 River Rd., Schenectady 5, N. Y. (Tel. FRanklin 4-2211)
Mgr.-Aviation & Marine System Engrg. Section: W. E. Jacobsen

GENERAL ELECTRIC CO., MISSILE & ORDNANCE SYSTEMS DEPT.
3198 Chestnut St., Philadelphia, Pa. (Tel. EVergreen 2-7800)
Mgr.-Contract Purch.: L. E. Bradbury
Mgr.-Subcontract Purch.: K. N. Thompson
Mgr.-Fabrication Purch.: E. J. Keegan
Mgr.-Electronic Purch.: F. A. Fanella
Mgr.-Purch. Admin.: R. M. Kirchhofer
Mgr.-Mktg.: R. M. Fritz WN, GS, GE

GENERAL ELECTRIC CO., MISSILE & ORDNANCE SYSTEMS DEPT.
Lakeside Ave., Burlington, Vt. (Tel. UNiversity 3-3411) MF, WN, PS, GS

GENERAL ELECTRIC CO.-WIRE & CABLE & CONDUIT PRODUCTS DEPTS.
1285 Boston Ave., Bridgeport, Conn. (Tel. EDison 4-1012)

GENERAL ELECTRONIC LABS., INC.
18 Ames St., Cambridge, Mass. (Tel. UNiversity 4-8500)
Purch. Agent: A. Grogan
Sales: R. T. Pritchard TR

GENERAL ENGRG. LABORATORIES, AMERICAN MACHINE & FOUNDRY CO.
11 Bruce Pl., Greenwich, Conn. (Tel. NOrmandy 1-7400)
Mgr.: H. A. Quinn

GENERAL FILTERS, INC.
43800 Grand River Ave., Novi, Mich. (Tel. Fieldbrook 9-2481)
V. P.-Purch.: Roland A. Redner
Pres.: Mrs. Grace Redner

GENERAL FINDINGS & SUPPLY CO., INDUSTRIAL DIV.
School & Pearl Sts., Attleboro, Mass. (Tel. ATtleboro 1-1155)
Purch.: Tom Ireland
Mgr.-Sales: Gerald F. Tucci MF, WN, PS, GE, TR

GENERAL FIRE EXTINGUISHER CORP., THE
25631 Little Mack, St. Clair Shores, Mich. (Tel. PRescott 6-8300)
Factory Serv. Mgr.: G. F. Rushford
Purch. Agent: Don Marion GS

GENERAL GASKET INC.
Middletown, Conn. (Tel. DIamond 6-6203)
V. P.-Purch.: E. London
V. P.-Sales: D. London MF, WN, PS, GE, TR

GENERAL INSTRUMENT CORP., DEFENSE PRODUCTS DIV.
65 Gouverneur St., Newark 4, N. J. (Tel. HUmboldt 5-2100)
Dir.-Purch.: J. Heimbruch
Asst. to Corp. V. P.-Sales: Bert E. Smith WN, PS, GS, GH, GE

GENERAL KINETICS, INC.
555 23rd St., S., Arlington 2, Va. (Tel. OTis 4-7555)
Purch. Agent: S. P. Vanderslice
V. P.-Sales: W. L. Anderson TS

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

GENERAL LABORATORY ASSOCIATES, INC.
17 E. Railroad St., Norwich, N. Y. (Tel. 4-3264)
Purch. Agent: Harold H. Horton
Dir.-Sales & Service: L. A. DeMellier
PS

GENERAL LOGISTICS, DIV.-AEROQUIP CORP.
P. O. Box 1071-M, 990 S. Fair Oaks Ave., Pasadena, Calif. (Tel. RYan 1-2893)
Chief Purch. Agent: Tom Box
Sales Mgr.: R. Mosher GS, GH

GENERAL MAGNETICS, INC.
135 Bloomfield Ave., Bloomfield, N. J. (Tel. PIlgrim 8-2400)
Ralph W. Froese PS, GE

GENERAL NUCLEAR CORP.
550 5th Ave., New York 34, N. Y. (Tel. PLaza 7-3638)
Sales: D. Reynolds
WN, PS, GS, GH, GE, CO, TS, TR

GENERAL PHOTO PRODUCTS CO., INC.
15 Summit Ave., Chatham, N. J. (Tel. ME 5-5200)
Mgr.: R. J. Paulas GS

GENERAL PLASTICS CORP. OF INDIANA
1400 N. Washington, Marion, Ind. (Tel. 4870)
Pres.: Richard H. Erlewine

GENERAL PLASTICS CORP. OF NEW JERSEY
165 3rd Ave., Paterson, N. J. (Tel. ARmory 4-4710)
Purch. Agent: H. Barto
Sales: E. W. Davidson

GENERAL PRECISION LAB. INC.
63 Bedford Rd., Pleasantville, N. Y. (Tel. ROgers 9-5000)
Purch.: A. C. Schweiber
Mgr., Avionic Sales: L. A. Smith
Mgr., Ind. Sales: N. M. Marshall
GS, GE, TR

GENERAL RADIO CO.
275 Massachusetts Ave., Cambridge 39, Mass. (Tel. TRowbridge 6-4400)
Purch. Mgr.: Colby E. Kelly, 22 Baker Ave., West Concord, Mass. (Tel. EMerson 9-4400, Ext. 202)
Sales Mgr.: Myron T. Smith

GENERAL RAILWAY SIGNAL CO.
P. O. Box 600, Rochester 2, N. Y. (Tel. Idlewood 6-2020)
Purch. Agent: W. T. Naylon
Asst. Purch. Agent: W. Downhill
Buyers: T. M. Costello & C. B. Jones
V. P.-Sales: P. W. Smith
MF, WN, PS, GS, GH, GE, CO, TS, TR

GENERAL R-F FITTINGS, INC.
702 Beacon St., Boston 15, Mass. (Tel. KEnmore 6-2290)
Purch. Dir.: Robert Hoff
Asst. Purch. Dir.: Carol Weis
V. P.-Engrg. & Sales: Owen L. Cook
MF, PS, GS, GH, GE, CO, TS, TR

GENERAL SCIENTIFIC EQUIPMENT CO.
7516 Limekiln Pike, Philadelphia 50, Pa. (Tel. HAncock 4-1550)
Purch. Agent: J. Q. Kline
Head-Sales: M. Kline
PS, GS, GH, GE, CO, TS, TR

GENERAL SOUND CONTROL, INC.
6711 S. Sepulveda Blvd., Los Angeles 45, Calif. (Tel. ORegon 8-3724)
Purch. Agent: Richard E. Sheranian
Sales Mgr.: Richard S. Dryden

GENERAL TRANSISTOR CORP.
91-27 138th Pl., Jamaica 35, N. Y. (Tel. HIckory 1-1000)
Purch. Agent: John Grillo TR

GENERAL TRANSISTOR WESTERN CORP.
6110 Venice Blvd., Los Angeles 34, Calif. (Tel. WEbster 3-5867)
V. P.-Engrg.: Martin Braude
Prod. Mgr.: Hugh Aspinwall GE, TR

GEORATOR CORP.
Manassas, Va. (Tel. 565)
Purch.: Raymon A. Prange
Sales: Shelley Krasnow

GERTSCH PRODUCTS INC.
3211 S. La Cienega Blvd., Los Angeles 16, Calif. (Tel. TExas 0-2761)
Purch. Agent: Wm. R. Kuennen
V. P.-Sales: Sam F. Arn
GE, CO, TS, TR

GIBSON ELECTRIC CO.
Box 559, Delmont, Pa. (Tel. HOward 8-7701)
Purch. Agent: Raymond C. Hannegan
Buyer & Asst. Purch. Agent: Miss Addie Glaub
Sales Mgr.: Frederick R. Farnham
MF, PS, GE, TR

FRED S. GICHNER IRON WORKS INC.
1214 24th St., N. W., Washington 7, D. C. (Tel. FEderal 3-6500)
Pres.: Henry Gichner GH, TR

GILMORE INDUSTRIES INC.
5713 Euclid Ave., Cleveland 3, O. (Tel. HE 2-2828)
Buyer: G. Algie
GS, GH, GE, CO, TS

GIRDLER PROCESS EQUIP. DIV., NATIONAL CYLINDER GAS CO.
P. O. Box 43, Louisville 1, Ky.
Sales: Edwin Gray

GITS BROTHERS MFG. CO.
1846 S. Kilbourn Ave., Chicago 23, Ill. (Tel. LAwndale 1-3554)
Purch. Agent: Mr. Sherman
Sales: R. W. Barz PS, GS, TS

GLADDING, McBEAN & CO.
2901 Los Feliz Blvd., Los Angeles 39, Calif. (Tel. NOrmandy 3-3361)
Purch. Agent: Boyd Moon WN

GLASSCO INSTRUMENT CO.
660 S. Fair Oaks Ave., Pasadena 2, Calif. (Tel. RYan 1-8858)
Factory Supt.: George Northrop
V. P.-Sales: C. W. Froude
PS, GE, CO, TS

GLASSEAL PRODUCTS CO., INC.
1111 E. Elizabeth Ave., Linden, N. J. (Tel. HUnter 6-2067)
Purch. Agent: K. McCloskey
Sales Mgr.: Alexander Anderson

GLISTEN CO., THE
P. O. Box 281, Hillsdale, Mich. (Tel. HE 7-4343)
Harold K. Slade GH

GLOBAR PLANT, REFRACTORIES DIV.-THE CARBORUNDUM CO.
Niagara Falls, N. Y. (Tel. 5715)
Sales Mgr.: D. S. Bowman GE, TR

GLOBE AUTOMATIC SPRINKLER CO.
2035 Washington Ave., Philadelphia 46, Pa. (Tel. PEnnypacker 5-4340)
Purch. Agent: W. E. Webb
Gen. Sales Mgr.: C. T. Mallory GS

GLOBE INDUSTRIES, INC.
1784 Stanley Ave., Dayton, O. (Tel. BAldwin 2-3741)
Purch. Agent: John Trostle
Purch.: Lester Zartman & Robert McRose
Sales Mgr.: Yale J. Holt PS, GS, GE

GOE ENGRG. CO.
219 S. Mednik Ave., P. O. Box 22004, Los Angeles 22, Calif. (Tel. ANgeles 1-2183)
Purch. & Sales: Jack Georgl
Purch.: Robert Relly & Kay Glen
MF, WN, PS, GS, GE, TS, TR

GOLDSMITH BROTHERS SMELTING & REFINING CO.
1300 W. 59th St., Chicago, Ill. (Tel. WAlbrook 5-3800)
Sales Mgr.: A. G. Wahlen
MF, WN, PS, GS, GE, CO, TS

JOHN GOMBOS CO., INC.
111 Montgomery Ave., Irvington, N. J. (Tel. ESsex 3-6633)
Buyer: J. M. Fuller
Production Control Dept.: M. Levitch
Methods Dept.: J. Marcelli
Sales Mgr.: Harold J. Schatz
GE, TS, TR

GOOD-ALL ELECTRIC MFG. CO.
112 W. First St., Ogallala, Nebr. (Tel. 900)
Purch. Agent: Frank Pincheon
Asst. Purch. Agent: Donald Buell
Sales Mgr.: E. M. Sheridan
GS, GE, TR

B. F. GOODRICH AVIATION PRODUCTS
500 S. Main St., Akron, O. (Tel. BLackstone 3-1171)
Gen. Mgr.-Sales: E. H. Fitch

B. F. GOODRICH INDUSTRIAL PRODUCTS CO.
500 S. Main St., Akron 18, O. (Tel. BLackstone 3-1171)
MF, WN, PS, GH, GE

GOODYEAR AIRCRAFT CORP.
1210 Massillon Rd., Akron 15, O. (Tel. REpublic 3-6361)
Purch. Agent: H. A. Delaney
Mgr.-Material Purch.: A. L. Gravesmuehl
Mgr.-Subcontract Purch.: W. R. Reed
V. P.-Sales: R. W. Richardson

GORDON ENTERPRISES
5362 N. Cahuenga Blvd., N. Hollywood, Calif. (Tel. POplar 6-3725)
Dir.-Purch.: D. M. Stern
Sales Mgr.: G. W. Sutphin
MF, WN, PS, GS, GH, GE, CO, TS, TR

GORDOS CORP.
250 Glenwood Ave., Bloomfield, N. J. (Tel. PIlgrim 3-6800)
Purch. Agent: T. R. Gutch GE, TS, TR

GORMAN-RUPP CO., THE
305 Bowman St., Mansfield, Ohio (Tel. LAfayette 4-4211)
Dir.-Purch.: C. R. Rupp
Purch. Agent: F. R. Frederick
Government Sales: R. E. Owens
V. P.-Sales: K. H. Cadigan GS, GH

GORRELL & GORRELL
336 Old Hook Rd., Westwood, N. J. (Tel. NOrth 4-7757)
Dir.-Purch.: John Gorrell
Plant Mgr.-Purch.: Bert Bock
Chief Engr.-Purch.: Orvis Scudder TS

GOSLIN ELECTRIC & MFG. CO.
2921 W. Olive Ave., Burbank, Calif. (Tel. VIctoria 9-3025)
Purch. Agent: A. M. Galbraith
Buyers: E. B. Horell & A. J. Goslin, Jr.
PS, GS, GE, TS, TR

GRAFLEX, INC.
3750 Monroe Ave., Rochester 3, N. Y. (Tel. LUdlow 6-2020)
Dir.-Proc.: Arthur Rutherford
Purch. Agent: C. J. Krembel
Asst. Purch. Agent: J. C. Hart
Contract Sales Mgr.: G. W. Lehman

GRAFO COLLOIDS CORP.
310 Wilkes Place, Sharon, Pa. (Tel. DI 6-5023)
Asst. Secy.-Purch.: D. M. Zarella
Sales Mgr.: John P. Powers PS, GS

★GRAND CENTRAL ROCKET CO.
Box 111, Redlands, Calif. (Tel. PYramid 3-2211)
Dir.-Materiel: H. L. Rodgers
Buyer: R. Twydell
Dir.-Customer Relations: K. E. Snelling
MF, PS, GS
★(See advertisement in this issue)

GRANT GEAR WORKS, INC.
161 W. 2nd St., Boston, Mass. (Tel. AN 8-4408)
Purch. Agent: J. F. Cromwell
Sales & Adv. Mgr.: F. E. Emery
PS, GS

★GRANT PULLEY & HARDWARE CORP.
High St., West Nyack, N. Y. (Tel. NYack 7-4400)
Purch. Mgr.: Mrs. Kay Saller
Sales: Jack Vissman
★(See advertisement in this issue)

★GRAPHITE METALLIZING CORP.
1038 Nepperhan Ave., Yonkers, N. Y. (Tel. YOnkers 8-8400)
V. P.-Purch. & Factory Mgr.: Edward E. Williams
Gen. Mgr.-Sales: Warren W. Walker
MF, WN, PS, GS, GE, CO, TS, TR
★(See advertisement in this issue)

GRASS INSTRUMENT CO.
101 Old Colony Ave., Quincy 70, Mass. (Tel. PResident 3-0002) GS, TS, TR

GRAY CO., INC.
60 11th Ave., N. E., Minneapolis 13, Minn. (Tel. FEderal 6-9331)
Purch. Agent: W. F. Bloedow
Asst. Purch. Agent: L. Wandel
Ind. Sales Mgr.: E. L. Niederloh
PS, GS

GRAY & HULEGUARD, INC.
930 N. Hancock Ave., Los Angeles 46, Calif. (Tel. OLympia 2-6670)
Purch. Agent: Dan Barmish
Sales: H. V. Huleguard
MF, WN, PS, GS, GE

GRAY INSTRUMENT CO.
202 E. Church Lane, Philadelphia 44, Pa. (Tel. GE 8-3168)
Treas.: Tom Mather
V. P.-Sales: A. R. Bechtel

GRAY & KUHN INC.
20 Railroad Ave., Roslyn Hts., N. Y. (Tel. MAyfair 1-7575)
John E. Gray GE

GRAY MFG. CO., THE
16 Arbor, Hartford, Conn. (Tel. ADams 3-1271)
Dir.- Purch.: M. E. Cavagnac
Purch. Agent: D. Vandercook
Electrical Purch. Buyer: W. Allyn
Buyer: N. Weldon
Sales: N. S. Barnes GE, CO, TS, TR

GREAT EASTERN METAL PRODUCTS CO.
22 Woodworth Ave., Yonkers, N. Y. (Tel. 5-7555)
Pres.: Lester Weinberg GS, GH, TR

GREAT LAKES MFG. CORP.
4223 Monticello Blvd., Cleveland 21, Ohio (Tel. EVergreen 2-5500)
Purch. Agent: R. A. Swanson
Buyer: S. E. Baginski
Pres.: J. A. Kanuch
MF, WN, PS, GS, GH, GE, TS

ARNOLD GREEN & CO., INC.
122 Hampshire St., Cambridge 39, Mass. (Tel. UNiversity 4-8800)
V. P.: Robert Halliday RE

GREEN INSTRUMENT CO.
385 Putnam Ave., Cambridge 39, Mass. (Tel. ELiot 4-2989)
Purch. Agent: Lynd F. Tillyer
Sales Mgr.: W. Franklin Fullerton GS

GREEN RECTIFIER CO.
1-10 30th St., Fairlawn, N. J. (Tel. SWarthmore 7-8100)
Dir.-Purch.: I. Green
MF, WN, PS, GS, GH, GE, CO, TS, TR

GREENE, TWEED & CO.
340 Elm Ave., North Wales, Pa. (Tel. OXbow 9-4821)
V. P.: Walter S. Josephson
Asst. Purch. Agent: Dorothy M. Segall
Sales Mgr.: Walter J. Rooney

GREENBRIER INSTRUMENTS INC.
Ronceverte, W. Va. (Tel. MIdway 7-4358)
Office Mgr.: R. L. Weikle
Sales: Dr. D. N. Campbell
PS, GS, CO, TS, TR

GREENFIELD TAP & DIE CORP.
Sanderson St., Greenfield, Mass. (Tel. PR 3-3611)
Purch. Agent: Avery Bates
Sales: W. J. Eberlein MF

GREENLEAF MFG. CO., THE, DIV.-MANDREL INDUSTRIES INC.
7814 Maplewood Industrial Ct., St. Louis 17, Mo. (Tel. STerling 1-9888)
Purch. Agent: Phillip Mahony, 111 Bemiston, Clayton, Mo. (Tel. VOlunteer 1-6258)
Buyer: Jack Rybolt, Clayton, Mo.
Field Engrg. Mgr.: Edwin W. Cowen
WN, PS, GS, GH, GE, CO, TS, TR

★GREER HYDRAULICS, INC.
New York International Airport, Jamaica 30, N. Y. (Tel. OL 9-9700)
Purch. Mgr.: Ralph Betschart
Gen. Sales Mgr.: Edward M. Greer
Sales Mgr.-Prod. Div.: Leonard Seman
Sales Mgr.-Test Equip. Div.: Larry Winston
MF, PS, GS, GH, CO, TS
★(See advertisement in this issue)

GREMCO, INC.
P. O. Box 7115, 3535 N. Sylvania, Ft. Worth, Tex. (Tel. TErminal 4-2836)
Purch. Agent: A. Krsak
Sales Mgr.: J. D. Taliaferro
GS, GH, TS

GRIEVE-HENDRY CO., INC.
1401 W. Carroll Ave., Chicago, Ill. (Tel. TAylor 9-0200)
Purch. Agent: A. L. Green
Head-Sales: G. P. Grieve GS

JOHN GRIFFIN CO.
2157 James Ave., St. Paul 5, Minn. (Tel. MIdway 8-2810)
J. P. Griffin GS

GRIMES MFG. CO.
515 N. Russell St., Urbana, O. (Tel. 3-5221)
Purch. Agent: John Davis
Asst. Purch. Agent: Paul Roles
V. P.-Sales: L. B. Moore
MF, GS, GE, CO, TS, TR

GRISCOM-RUSSELL CO., THE
Massillon, Ohio (Tel. TE 2-7421)
Dir.-Purch.: J. A. O'Neill
Buyer: A. D. Miller
Sales Engr.: L. H. Bradley
WN, PS, GS

GROTNES MACHINE WORKS, INC.
5454 N. Wolcott Ave., Chicago 40, Ill. (Tel. LOngbeach 1-7693)
Purch. Agent: George C. Cuttner
Sales Mgr.: J. F. Coleman

GRUMMAN AIRCRAFT ENGINEERING CORP.
Bethpage, L. I., N. Y. (Tel. WElls 1-1550)
Purch. Dir.: Joseph A. Stamm

GUARDIAN ELECTRIC MFG. CO.
1621 W. Walnut St., Chicago 12, Ill. (Tel. CHesapeake 3-1100)
Purch. Agent: W. A. Rowell
Gen. Sales Mgr.: G. G. Rowell
GS, GE, CO, TS, TR

GUARDITE CO., DIV. OF AMERICAN-MARIETTA CO.
P. O. Box 188, Wheeling, Ill. (Tel. 1000)
Purch. Agent: O. W. Carter, Jr.
Environmental Sales: S. P. Voak
GS, TS

GUDEMAN CO., THE
340 W. Huron St., Chicago 10, Ill. (Tel. DElaware 7-7400)
Purch. Agent: Robert Eggersted
V. P.-Sales: D. A. Fillmore GE, TS, TR

GUIDED MISSILE DIV.-DE HAVILLAND AIRCRAFT OF CANADA, LTD.
Downsview, Ontario, Canada (Tel. MElrose 3-5230)
Purch. Agent: S. M. Gilbert
Asst. Purch. Agent: P. A. Hampson
Sales & Research Engr.: D. B. Cannon
PS, GS, GH, GE, CO, TS, TR

GULTON INDUSTRIES, INC.
212 Durham Ave., Metuchen, N. J. (Tel. LIberty 8-2800)
Purch. Agent: Julius Furchheimer
Sales: Robert Cunha
MF, WN, PS, GS, GE, CO, TS, TR

GUNNAR LABORATORIES
2989 26th St., W., Bradenton, Fla. (Tel. 5-2751)
Grad. Engr.-Purch.: Gunnar Knos
MF, PS, GE, TR

GWILLIAM CO., THE
370 Furman St., Brooklyn 1, N. Y. (Tel. MAin 4-2644)
Head-Purch. Dept.: Johannes E. Howay
PS, GE

HACKENSACK CABLE CORP.
110 Orchard St., Hackensack, N. J. (Tel. HUbbard 7-1100)
V. P.-Sales: A. F. Brady, Jr.
MF, PS, GS, GH, TS

B. H. HADLEY, INC.
1427 S. Garey, Pomona, Calif. (Tel. LYcoming 9-5075)
Purch. Agent: T. R. McCoun
Dir.-Sales: Joe Petrali
MF, WN, PS, GS

HAGAN CHEMICALS & CONTROLS, INC.
Hagan Bldg., Pittsburgh 30, Pa. (Tel. CO 1-4722)
Purch. Agent: C. R. Texter
Mechanical Equip. Buyer: Russell White
Sales: John Duesing
MF, PS, GS, GE, CO, TS, TR

HAHN & CLAY
5100 Clinton Dr., Houston, Tex. (Tel. ORchard 2-1671)
Mgr.-Purch.: Billie Sommers
V. P.-Purch.: Walter Clay
Gen. Mgr.-Fab. Steel: Lawrence F. Megow
V. P.-Sales: Gene Clay
MF, WN, PS, GS

HAINER VALVES, INC.
Box 1851, 2919 Gardenia Ave., Long Beach 1, Calif. (Tel. GArfield 7-5491)
V. P.-Purch.: V. C. Zillgitt
Sales Mgr.: C. P. Williamson

CODING	
Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

HALAX CORP.
17470 Shelbourne Way, Los Gatos, Calif. (Tel. ELgato 4-2720)
Gen. Mgr.: Arthur E. Oltz PS, GE

HALLAMORE ELECTRONICS CO.
8352 Brookhurst Ave., Anaheim, Calif. (Tel. PRospect 4-1010)
Chief Purch. Agent: E. H. Welton
Sr. Buyers-Electrical: James Wright & Gordon Helm
Sr. Buyer-Mechanical: Fred Consiglio
Buyer-Mechanical: William Young
V. P.-Contracts: John R. Frost
MF, WN, PS, GS, GH, GE, CO, TS, TR

HALLER RAYMOND & BROWN INC.
Circleville Rd., State College, Pa. (Tel. ADams 7-7611)
Head-Purch.: Jim Smith
Mgr.-Sales: L. D. Rexroat
MF, WN, PS, GS, GE, CO, TS, TR

HALLETT MFG. CO.
5910 Bowcroft St., Los Angeles 16, Calif. (Tel. TE 0-7094)
Mgr.-Proc.: Robert D. Leeseman
V. P.-Sales: Stanley E. Estes
MF, WN, PS, GS, GH, GE, CO, TS, TR

HALLIKAINEN INSTRUMENTS
1341 7th St., Berkeley 10, Calif. (Tel. LAndscape 4-1757)
Purch. Agent: W. C. Bagot
V. P. & Sales Mgr.: E. F. Schimbor

HALOGEN INSULATOR & SEAL CORP.
9950 Pacific Ave., Franklin Park, Ill. (Tel. GLadstone 5-9000)
Purch. Agent: Walter Lucas
Buyer: L. Oleksy
Head-Sales: H. L. Asp MF, PS

HAMILTON KENT MFG. CO.
427 W. Grant, Kent, O. (Tel. ORchard 3-9555)
Dir.-Purch.: David Green
Pres. & Sales Mgr.: T. S. Rowe
MF, PS, TR

HAMILTON WATCH CO.
Columbia Ave., Lancaster, Pa. (Tel. EX 4-7161)
Purch. Agent: C. S. Reese
Asst. Purch. Agent: J. H. Leaman
Dir.-Sales: H. S. Tholen

HAMILTON WATCH CO., HATHAWAY INSTRUMENT DIV.
5800 E. Jewell, Denver 22, Colo. (Tel. SKyline 6-8301)
Buyer: F. J. Knafele
Asst. Buyer: A. Wilner
Sales Mgr.: R. A. Miller GE, TS

HAMILTON WATCH CO., MILITARY PRODUCTS DIV.
Lancaster, Pa. (Tel. EXpress 4-7161)
Purch. Agent: Clarence S. Reese
Asst. Purch. Agent: J. H. Leaman
Mgr.-Customer Engrg. Military Prods. Div.: George F. Roberts
MF, WN, PS, GS, GE, CO, TS, TR

HAMLIN, INC.
1316 Sherman Ave., Evanston, Ill. (Tel. GReenleaf 5-8244)
Chief Engr.-Purch.: Arnold P. Darsch
GE

HAMMEL-DAHL, DIV.-GENERAL CONTROLS
Warwick Industrial Pk., Providence 5, R. I. (Tel. STuart 1-6200)
Purch. Agent: Forrest Brown
Sales: John R. Curran PS, GS

HAMMETT ELECTRIC CO.
2311 Tauromee Ave., Kansas City 59, Kans. (Tel. ATwater 1-6501)
Dir.-Purch.: Alvin H. St. Clair
MF, WN, PS, GS, GH, GE, CO, TS, TR

HAMNER ELECTRONICS CO., INC.
Route 546, Pennington-Lawrenceville Rd., Pennington, N. J. (Tel. PEnnington 7-1320)
Purch. Agent: Edward J. Williams
Pres.: Lloyd H. Hamner

HAMPDEN BRASS & ALUMINUM CO.
262 Liberty St., Springfield 1, Mass. (Tel. REpublic 6-1808)
Purch. Agent: Richard A. Wallace

HANDY & HARMAN
82 Fulton St., New York 38, N. Y. (Tel. BEekman 3-2460)
MF, WN, PS, GE, TR

HANLON & WILSON CO., THE
Pittsburgh 21, Pa. (Tel. PS 1-1250)
Purch. Agent: H. Cleevely
Chief Engr.: S. J. Hannon
Sales Mgr.: W. G. Weil PS, GS, GH, GE

HANSEN ELECTRONICS CO.
7117 Santa Monica Blvd., Los Angeles 46, Calif. (Tel. HO 9-3052)
Gen. Mgr.: E. K. Stokes GE, TR

HANSEN MFG. CO. INC.
1004 S. Hart St., Princeton, Ind. (Tel. FUlton 5-3415)
Treas.: A. C. Rothert PS, GE

HANSON-GORRILL-BRIAN, INC.
85 Hazel St., Glen Cove, N. Y. (Tel. GL 4-7300)
Purch. Agent: J. S. Truesdell
Sales Mgr.: W. K. Burlingame
GE, CO, TS, TR

HARBISON-WALKER REFRACTORIES CO.
307 Fifth Ave., Pittsburgh 22, Pa. (Tel. ATlantic 1-0942)
Gen. Purch. Agent: E. L. O'Meara, Jr.
V. P.-Sales: C. A. Brashares GS

HARCO LABS., INC.
79 Olive St., New Haven, Conn. (Tel. SPruce 7-5351)
Purch. Agent: M. M. Gagliardi
MF, PS, GS, GH, GE, CO, TS

HARMAN EQUIPMENT CO.
3605 E. Olympic Blvd., Los Angeles 23, Calif. (Tel. ANgeles 1-4113)
Office Mgr.: F. Van Zant
Chief Engr.: C. V. Wilson
PS, GS, GH, TS

HARMON, LICHTENSTEIN & CO.
26 Broadway, New York, N. Y. (Tel. HAnover 2-8395)
Head-Sales: R. B. Harmon
MF, WN, PS, GE, TR

HARPER-LEADER, INC.
1046 S. Main St., Waterbury 20, Conn. (Tel. PLaza 6-8164)
Secy.-Treas.: I. Cross
MF, WN, PS, GE, TR

HARRIS REFRIGERATION CO.
308 River St., Cambridge 39, Mass. (Tel. UNiversity 4-4000)
Sales Engr.: Charles W. J. Harris TS

HARRISBURG STEEL CO.
Herr St., Harrisburg, Pa. (Tel. CEdar 4-8021)
Dir.-Purch.: Lee Muth
V. P.-Sales: H. M. Reeser
MF, WN, PS, GS, GH

HART MFG. CO., THE
147 Bartholomew Ave., Hartford 1, Conn. (Tel. JAckson 5-3491)
Purch. Agent: R. W. James
V. P.-Sales: J. F. Dreier GE

HART METAL PRODUCTS CORP.
3333 Hammond Ave., Elkhart, Ind. (Tel. 2-5510)
Purch. Agent: Pliny Bennett
Aircraft Sales: N. C. Cunningham MF

★HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.
Box 1440, Hartford 2, Conn. (Tel. JAckson 5-0821)
Purch. Agent: D. T. Bacon
Asst. Purch. Agent: M. R. Derrick
Buyers: J. Braine & R. Mullowney
Gen. Sales Mgr.: J. F. Miller
MS, WN, PS, GS
★(See advertisement in this issue)

★HARTMAN ELECTRICAL MFG. CO., THE
179 N. Diamond St., Mansfield, O. (Tel. LAfayette 4-1411)
Purch. Agent: W. M. Locke
Asst. Purch. Agent: T. G. Roehm
V. P.-Sales & Engrg.: A. W. Hartman
GS, GH, GE
★(See advertisement in this issue)

HARVEY ALUMINUM
19200 S. Western Ave., Torrance, Calif. (Tel. NEvada 6-2111)
Purch.: Dorsey Smith
MF, PS, GS, GH

HASKEL ENGRG. & SUPPLY CO.
1236 S. Central Ave., Glendale 4, Calif. (Tel. CHapman 5-6811)
Sales Mgr.: Ralph W. Moss
PS, GS, GH, TS

JOHN HASSALL, INC.
Box 2179, Westbury, L. I., N. Y. (Tel. EDgewood 4-6200)
Purch.: W. W. Smith
Sales: E. F. Karnes MF, WN, GS

HASTINGS PLASTICS INC.
Santa Monica, Calif.
MF, WN, PS, GS, GH, GE, TR

★HAWS DRINKING FAUCET CO.
4th & Page Sts., Berkeley 10, Calif. (Tel. LAndscape 5-3341)
Gen. Mgr.: J. E. Traynor
Sales Mgr.: T. R. Haws
★(See advertisement in this issue)

★A. W. HAYDON CO., THE
231-D N. Elm St., Waterbury, Conn. (Tel. PLaza 6-4481)
Purch. Agent: Roy E. Ahlberg
Purch. Dept.: Fred. Lawton & John Frederick
Sales Mgr.: R. J. Harrant
WN, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

HAYDON DIV.-GENERAL TIME CORP.
1000 E. Elm St., Torrington, Conn. (Tel. HUnter 9-3158)
Purch. Agent: H. L. Sheridan
Buyer: J. E. Nicholas
Sales Mgr.: H. L. Reycroft, Jr.
PS, GE, CO, TS, TR

HAYDON SWITCH, INC.
536 S. Leonard St., Waterbury, Conn. (Tel. PLaza 6-7441)
Purch. Agent: John J. Leugminas
Sales Mgr.: Arthur N. Milliken GE

C. I. HAYES, INC.
800 Wellington Ave., Cranston 10, R. I. (Tel. HOpkins 1-3400)
Purch. Agent: Ray C. Arnold
Gen. Sales Mgr.: James R. Elliott

HAYNES STELLITE CO.,-DIV.-UNION CARBIDE CORP.
725 S. Lindsay St., Kokomo, Ind. (Tel. GLadstone 2-5421)
Purch. Agent: J. H. Wallsmith
Asst. Purch. Agent: M. E. Jenkins
Asst. to Purch. Agent: C. J. Dalton
Abrasives Engr.: R. S. Rees
Buyers: R. M. Tudor, H. M. Wolf & J. R. Clawson
V. P.-Sales: R. L. Lerch MF, PS

HAYS MFG. CO.
803 W. 12th St., Erie, Pa. (Tel. 2-3225)
Directors: P. N. Christensen & H. H. Clemens

★HAYWARD SCIENTIFIC GLASS CORP.
217 Magnolia Ave., Whittier, Calif. (Tel. OX 5-8213)
Secy.: Henry D. Shaw
Sales Mgr.: James L. Wood
GS, GH, GE, TS, TR
★(See advertisement in this issue)

HAZELTINE ELECTRONICS DIV.-HAZELTINE CORP.
59-25 Little Neck Pkwy., Little Neck 62, N. Y. (Tel. FLushing 7-8700)
Asst. V. P.-Purch.: B. H. Rogers
Purch.: H. A. Brown & E. L. Roseberry
V. P.-Sales: S. M. Thomas
WN, GS, GE, TR

HEILAND DIV.-MINNEAPOLIS-HONEYWELL
5200 E. Evans Ave., Denver 22, Colo. (Tel. SKyline 6-3681)
Purch. Agent: R. V. Bertram
Asst. Purch. Agents: Warren Lindross & Phyllis Giffin
Mgr.-Instrument Sales: Lloyd J. Moyer
PS, GS, GE, CO, TS, TR

HEIN-WERNER CORP.
1200 National Ave., Waukesha, Wisc. (Tel. LIberty 2-6611)
Purch. Agent: M. L. Lumb
Sales Mgr.: H. J. Scullin MF, GS

HELDOR MFG. CO., INC.
238 Lewis St., Paterson, N. J. (Tel. ARmory 1-0900)
Purch. Agent: Joe Curtain
Sales Mgr.: Ray Walker
MF, WN, PS, GS, GE

HELI-COIL CORP.
Shelter Rock Lane, Danbury, Conn. (Tel. Pioneer 3-3851)
Purch. Agent: Ted C. Gorman
Dir.-Sales: John E. Fasano MF, PS

HELIPOT CORP.
Newport Beach, Calif. (Tel. LIberty 8-0611)
Purch. Agent: Harlan Eastman
Sales Mgr.: Karl Heller
PS, GS, GE, CO, TS, TR

HELWIG CO.
2550 N. 30th St., Milwaukee 10, Wisc. (Tel. HIlltop 2-7755)
Purch. Agent: N. E. Joers
V. P.-Sales: J. E. Koenitzer GE

HENLOPEN MFG. CO., INC.
178 Cook St., Brooklyn 6, N. Y. (Tel. GL 6-4461)
Purch. Agent: Allan Costa

HENRY & MILLER INDUSTRIES, INC.
675 Garfield Ave., Jersey City, N. J. (Tel. HEnderson 4-4200)
Purch.: Edmund B. Schnur

HEPPENSTALL CO.
3000 Shelby St., Indianapolis, Ind. (Tel. ST 6-9261)
Purch. Agent & Mgr.-Ring Sales: V. H. Lanahan

HERCULES POWDER CO.
900 Market St., Wilmington 99, Del.
Dir.-Purch.: Edwin S. Ladley MF, PS

HERLO ENGRG. CORP.
549 N. Prairie Ave., Hawthorne, Calif. (Tel. OS 5-4456)
Gen. Mgr.: R. E. Cole
Office Mgr.: J. D. Gifford PS, GS

HERMETIC SEAL TRANSFORMER CO., DIV.-SOUTHWESTERN INDUSTRIAL ELECTRONICS
555 N. 5th St., Garland, Tex. (Tel. BRoadway 6-5141)
Purch. Agent: J. M. Whalen
Expediter: C. W. Rhys
Sales Mgr.: Everett Abrams, Jr.

HERTNER ELECTRIC CO., THE
12690 Elmwood Ave., Cleveland 11, O. (Tel. CLearwater 2-4242)
Purch. Agent: A. G. Lindrose
Sales Mgr.: R. C. Neiswander

HETHERINGTON, INC.
1420 Delmar Dr., Folcroft, Pa. (Tel. LUdlow 3-2100)
Buyer: Edwin L. Kershaw

HEVI-DUTY ELECTRIC CO.
2040 W. Wisconsin Ave., Milwaukee, Wis. (Tel. WEst 3-9339)
Purch. Agent: George Bethke
GS, GE, TR

HEWITT-ROBINS, INC.
666 Glenbrook Rd., Stamford, Conn. (Tel. DAvis 4-1151)
Dir.-Purch.: C. W. Mottinger
V. P.-Sales: F. L. Griffith
MF, PS, GS, GH

HEXCEL PRODUCTS INC.
2741 9th St., Berkeley 10, Calif. (Tel. THornwall 1-2051)
Purch. Agent: R. J. Wedemyer
Buyer: M. V. Hess
V. P.-Sales: R. T. Hughes MF

HICKOK ELECTRICAL INSTRUMENT CO., THE
10514 Dupont, Cleveland 8, O. (Tel. LIberty 1-8060)
V. P.-Purch.: F. Sawonik
V. P.-Sales & Mktg.: H. D. Johnson

HICKS CORP., THE
1671 Hyde Park Ave., Boston 36, Mass. (Tel. HY 3-2720)
Purch. Agent: J. L. McLeod
V. P.-Sales: John C. Reimers
MF, WN, PS, GS, TS

HI-G, INC.
Bradley Field, Windsor Locks, Conn. (Tel. NAtional 3-3308)
Prod. Mgr.: A. Molava
V. P.-Sales: R. H. Wood GE, TR

HIGH VACUUM EQUIPMENT CORP.
2 Churchill Rd., Hingham, Mass. (Tel. RIverview 9-2430)
Sales Admin.: William B. White
PS, GS, GH, GE, CO, TS

HIGHLAND ENGRG. CO.
90 Magnolia St., Westbury, N. Y. (Tel. EDgewood 3-2933)
Purch.: M. A. Paterson
Sales: W. R. Spittal

E. VERNON HILL & CO.
P. O. Box 189, Lake Geneva, Wisc. (Tel. CHestnut 8-3729)
Pres.: N. Peterson
MF, PS, GS, GE, CO, TS, TR

HILLBURN ELECTRONIC PRODS. CO.
55 Nassau Ave., Brooklyn 22, N. Y. (Tel. STagg 2-3875)
Purch.: B. S. Gilman
Sales: S. A. Shaw GE

HILLS-McCANNA CO.
3641 W. Touhy Ave., Chicago, Ill. (Tel. ORchard 4-7080)
Purch. Agent: R. Schmidt
Sales Mgr.-Foundry Div.: R. I. Allen
MF, PS, GS

HI-LO MANUFACTURING CORP.
1122-26 W. Newport Ave., Chicago 13, Ill. (Tel. GRaceland 7-1890)
Gen. Mgr.: E. A. Goncoe
GS, GH, GE, TS, TR

HINDLE TRANSFORMER CO. INC.
Woods Church Rd., R. D. 3, Flemington, N. J. (Tel. 836)
Purch. Agent: Mrs. Anne Schrimpe
GS, GE, TS, TR

HI-SHEAR RIVET TOOL CO.
2600 W. 247th St., Torrance, Calif. (Tel. DAvenport 6-8 10)
Purch. Agent: Henry J. Rado, 8924 Bellanca Ave., Los Angeles 45, Calif. (Tel. ORegon 8-4361)
Asst. Purch. Agent: Stirling Souder, Los Angeles
V. P.-Sales: Guy Nash
MF, WN, PS, GS

HI-SPEC ELECTRONICS CORP.
7328 Ethel Ave., North Hollywood, Calif. (Tel. POplar 5-5075)
Purch. Agent: C. A. Hale
Asst. Purch. Agent: R. Y. Patterson
Sales Mgr.: John H. Mattson GE, TR

HITCHINER MFG. CO., INC.
Milford, N. H. (Tel. MIlford 635)
Purch. Agent: Ralph Bodwell
Plant Engr.: L. Guertin
Gen. Mgr.: David Hoodley
Sales Mgr.: William H. Shuman
MF, PS

HITEMP WIRES, INC.
1200 Shames Dr., Westbury, N. Y. (Tel. EDgewood 3-4600)
Purch. Agent: Patrick Hoade
Asst. Purch. Agent: Janet Lewis
V. P.-Sales: George D. Newman
MF, PS, GS, GH, CO, TS, TR

HI-TEST CHEMICAL CORP.
722 64th St., Brooklyn, N. Y. (Tel. TE 6-5991)
Purch.: David Raps MF, TS, TR

HOBSON BROTHERS, INC.
4940 W. Lawrence Ave., Chicago 30, Ill. (Tel. Avenue 3-3600)
Purch. Agent: H. L. Behm
Sales: Roy D. Hobson

HOEFNER CORP.
9720 Rush St., El Monte, Calif. (Tel. CUmberland 3-4138)
Purch. Agent: Arnold E. Tapie
Buyer: Dorothy L. Myers
V. P.-Sales: Grant W. Fredericks
PS, GS

P. R. HOFFMAN CO.
321 Cherry St., Carlisle, Pa. (Tel. 1090)
Purch. Agent: Ralph J. Laury
Chemist: Warren J. Hunt
V. P.-Sales: Leon W. McGinnes GS

HOFFMAN ELECTRONICS CORP., SEMI-CONDUCTOR DIV.
930 Pitner Ave., Evanston, Ill. (Tel. University 9-9850)
Purch. Agent: Mrs. Dorothy Perkins
V. P.-Mktg.: Richard N. Golbach
GS, GE, TS, TR

HOFFMAN ENGRG. CORP.
9th & Tyler, Anoka, Minn. (Tel. HA 1-2240)
Supt.: Philip DeJarlais
Gen. Mgr.: Reuben C. Krauik GH

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

HOFFMAN LABS. DIV., HOFFMAN ELECTRONICS CORP.
3761 S. Hill St., Los Angeles 7, Calif. (Tel. RIchmond 7-4488)
Dir.-Purch.: R. A. Gingrich
V. P.-Mktg.: G. B. Gelly
MF, WN, PS, GS, GE, CO, TS, TR

★HOFMAN LABS., INC.
5 Evans Terminal, Hillside, N. J. (Tel. ELizabeth 4-4016)
V. P.-Engrg.: Paul Booth
Exec. V. P.: James Cox
Purch. Agent: Bernard Alperstein GH
★(See advertisement in this issue)

ALFRED HOFMANN & CO.
635 59th St., West New York, N. J. (Tel. UNion 3-1300)
Purch. Agent: J. Meehan
Sales Mgr.: E. Weikert
MF, WN, PS, GS, GE

HOGAN LABORATORIES, INC.
155 Perry St., New York 14, N. Y. (Tel. CHelsea 2-7855)
Purch. Agent: Garrett Moore
Exec. V. P.-Sales: Raymond W. Bristol
GE, CO, TS, TR

C. G. HOKANSON CO., INC.
2140 Pontius Ave., Los Angeles 25, Calif. (Tel. GR 7-4231) MF, GS, GE

HOKE INC.
148 S. Dean St., Englewood, N. J. (Tel. LOwell 8-9100)
Head-Purch.: R. MacLallen
Dir.-Mktg.: E. B. Hitchock
MF, PS, GS

A. F. HOLDEN CO., THE
14341 Schaefer Hwy., Detroit 27, Mich. (Tel BRoadway 3-5405)
V. P.-Purch.: J. B. Carey

HOLEX, INC.
2751 San Juan Rd., Hollister, Calif. (Tel. MErcury 7-5306)
V. P.-Operations: George H. Anderson
Chief Inspector: Howard Renshaw
MF, WN, PS, GS, GH

HOLT INSTRUMENT LABORATORIES, DIV.-HOLT HARDWOOD CO., INC.
Oconto, Wis. (Tel. 163)
Dir.-Engrg.-Purch.: C. P. DeWitt
Head-Sales: C. F. DeWitt
GS, GH, GE, TS

HOLUB INDUSTRIES, INC.
413 DeKalb Ave., Sycamore, Ill. (Tel. 2161)
Purch. Agent: A. R. Linden
Sales Mgr.: Gordon W. Wetzel
MF, PS, GS, GH

LUDWIG HONOLD MFG. CO.
Chester Pike & Folcroft Ave., Folcroft, Pa. (Tel. LUdlow 3-6800)
Purch. Agent: Robert Stabb
Jr. Buyer-Raw Material: Roy Jackson
Jr. Buyer-Subcontract Parts: Elise Vanwhy
Exec. V. P.-Sales: Norman J. Burke
MF, WN, PS, GS, GH

HOOF PRODUCTS CO.
6543 S. Laramie Ave., Chicago 38, Ill. (Tel. POrtsmouth 7-6330)
Purch. Agent: Conrad Disabato
Dir.-Sales: Carl E. Vaughn MF, PS

HOOVER ELECTRIC CO.
2100 S. Stoner Ave., Los Angeles 25, Calif. (Tel. GRanite 8-7748)
Dir.-Purch.: Lennart Rinne, 2041-2045 S. Barrington Ave., Los Angeles 25, Calif. (Tel. BRadshaw 2-3125)
Gen. Mgr.: Paul Cedwood
WN, PS, GS, GH, GE, TR

HOOVER ELECTRONICS CO.
110 W. Timonium Rd., Timonium, Md. (Tel. VAlley 5-5200)
Purch. Agent: John W. Yewell
Sales Mgr.: Thomas B. Schillo
WN, PS, GS, GH, GE, TR

HORSEY, ROBSON & CO., INC.
551 5th Ave., New York 17, N. Y. (Tel. MUrray Hill 7-1332)
Gen. Mgr.: Robert K. Robson
MF, WN, PS

HORST ENGRG. & MFG. CO.
36 Cedar St., East Hartford, Conn. (Tel. BUtler 9-9381)
Pres.: H. H. Livingston MF, WN

★HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
537 E. Delavan Ave., Buffalo, N. Y. (Tel. FIllmore 8000)
Purch. Agent: V. E. Lasker
Buyer: W. E. Thompson
Sales Mgr.: Armand C. Crossen
MF, WN, PS, GS, GE, CO, TS, TR
★(See advertisement in this issue)

E. F. HOUGHTON & CO.
303 W. Lehigh Ave., Philadelphia 33, Pa. (Tel. RE 9-7100)
Dir.-Purch.: H. B. Fox
Purch. Agent: C. F. Kalmbach
V. P.-Sales: D. J. Richards MF, PS, TS

T. J. HOULIHAN CO.
2508 W. Lawrence St., Chicago 25, Ill. (Tel. LO 1-0580)
Pres.: T. J. Houlihan GS, GE, TS, TR

HOUSTON FEARLESS CORP.
11801 W. Olympic Blvd., Los Angeles 64, Calif. (Tel. BRadshaw 2-4331)
Dir.-Prod. & Material: R. C. Wilcox, Jr.
Purch. Agent: Mrs. Rosemary Enderweis
V. P.-Sales: K. B. Elliott
MF, WN, PS, GS, TS, TR

HOWELL DEVICE CO.
1083 Erie Cliff, Cleveland 7, O. (Tel. LA 1-2784)
Purch.: R. S. Adams
Sales: R. C. Howell

HOYT ELECTRICAL INSTRUMENT WORKS, BURTON ROGERS CO.
42 Carleton St., Cambridge 42, Mass. (Tel. ELiot 4 1643)

HUBBARD-ANTISDEL
155 E. Silver Spring Dr., Milwaukee 17, Wis. (Tel. ED 2-7620)
Walter P. Luedke

HUBER INDUSTRIES, INC.
4974 Hillside Ave., Cincinnati, O. (Tel. WIllow 1-1800)
Purch. Agent: K. P. Huber
Buyer: Russell R. Roeder, Jr.
Sales Mgr.: J. E. Huber
MF, PS, GS, TS, TR

HUCK MFG. CO.
2480 Bellevue Ave., Detroit 7, Mich. (Tel. WAlnut 1-6207)
Purch. Agent: Leland W. Fox
Order Dept. Mgr.: W. J. Westrick
V. P.-Sales: George Q. Mathews
MF, WN, PS

HUDSON LAMP CO.
528 Elm St., Kearny, N. J. (Tel. WYman 1-4834)
V. P.-Purch.: J. D. Collins
V. P.-Sales: Philip S. Rust GS, TR

★HUDSON WIRE CO.
62 Water St., Ossining, N. Y. (Tel. WIlson 1-8500)
Plant Mgr.-Ossining Div.: R. R. Thompson
Purch. Agent-Winsted Div.: E. O. Goodrow, Winsted, Conn. (Tel. FRontier 9-3341)
Gen. Sales Mgr.: William H. Elliott, Jr.
MF, PS, GS, TR
★(See advertisement in this issue)

HUGGINS LABS., INC.
711 Hamilton Ave., Menlo Park, Calif. (Tel. DAvenport 6-3090)
Purch. Agent: Hazel Harting

HUGHES AIRCRAFT CO.
Culver City, Calif. (Tel. TExas 0-7111)
Missile Mfg. Div.: P. O. Box 5555 Tucson, Ariz. (Tel. MAin 4-2711)

HUGHES PRODUCTS, HUGHES AIRCRAFT CO., SEMICONDUCTOR DIV.
International Airport Sta., Los Angeles 45, Calif. (Tel. ORchard 2-5011)
Sales Mgr.: H. K. Mann GE

HUGHES TOOL CO., AIRCRAFT DIV.
Florence & Teale Sts., Culver City, Calif. (Tel. TExas 0-7111)
Dir.-Materiel: Milton E. Taylor
Purch. Agent: C. H. Witter
Prod. Senior Buyer: C. E. Ingalls
Non-Prod. Senior Buyer: R. L. Jones
Experimental Procurement: B. M. Lohr
Senior Buyer, Dir.-Contracts Admin.: Fred C. Mehner
MF, WN, PS, GS, GH, GE, CO, TS, TR

HUMIDIAL CO.
465 Mt. Vernon Ave., Colton, Calif. (Tel. TA 5-1793)
W. C. Blinn GS

HUMPHREY, INC.
2805 Canon St., San Diego 6, Calif. (Tel. ACademy 3-1654)
Purch. Agent: R. T. Rutherford
Chief Design Engr.: Donald G. Baker
V. P.-Sales Mgr.: John H. Bender

HUNT CORP., THE
453 Lincoln St., Carlisle, Pa. (Tel. 1486)
Purch.: M. E. Cochrane
Sales: Robert B. Ker GS, GE

★HUNTER MFG. CO.
30525 Aurora Rd., Solon, O. (Tel. CHurchill 8 6111)
Purch. Agent: J. C. Wolfe
V. P.-Sales Mgr.: Warren A. Miller
GS
★(See advertisement in this issue)

HUNTER SPRING CO.
One Spring Ave., Lansdale, Pa. (Tel. Ulysses 5-6838)
Purch. Agent: Horace Machado
Sales Mgr.: G. D. Bennett
MF, PS, GS, CO, TS

HUPP AVIATION CO.
6633 W. 65th St., Chicago 38, Ill. (Tel. POrtsmouth 7-2100)
Purch. Mgr.: James Bouis
Gen. Sales Mgr.: John W. Painter
MF, WN, PS, GS, GE

HUPP ELECTRONICS CO.
265 E. Pomfret St., Carlisle, Pa. (Tel. 1495)
Purch. Agent: Norman Eccles
Gen. Mgr.-Sales: Herman Shall GE

HUPP INSTRUMATION, DIV.-ERIE-PACIFIC
12932 S. Weber Way, Hawthorne, Calif. (Tel. ORegon 8-5418)
Purch. Agent: Dean L. Ramsey
Asst. Purch. Agent: Carol Bova
Sales Mgr.: George H. Osborn
CO, TS, TR

HUPPERT, K. H., CO.
6830 Cottage Grove Ave., Chicago 37, Ill. (Tel. MIdway 3-4770)
Plant Mgr.: James Matias
Sales Mgr.: R. A. Hastings

HUSSMANN AIRCRAFT DIV.
819 E. Taylor Ave., St. Louis 15, Mo. (Tel. EVergreen 2-9660)
Purch. Agent: F. A. Biller
Subcontr. Supervisor-Purch.: J. Cregan
Sales Mgr.: Edward O'Brien MF, GS

HUTCHENS & SON METAL PRODUCTS, INC.
P. O. Box 1355, Springfield, Mo. (Tel. 6-1979)
Purch. Agent: B. G. King
V. P.-Sales: Lewis G. Hutchens

WALTER J. HYATT CO., THE
P. O. Box 943, Beverly Hills, Calif. (Tel. BRadshaw 2-2844)
Sales: Walter J. Hyatt
MF, WN, PS, GS, GH, GE

HYCON EASTERN INC.
75 Cambridge Pkwy., Cambridge 42, Mass. (Tel. UNiversity 4-7200)
Purch. Agent: W. Senior
V. P.-Operations-Sales: J. R. Martin
WN, GS, GE, CO, TS, TR

HYDRA-POWER CORP.
10-12 Pine Court, New Rochelle, N. Y. (Tel. NE 2-2200)
Purch. Agent: J. Tranos
V. P.-Sales: E. D. Holland
MF, WN, PS, GS, GH, GE, TS, TR

HYDRAULIC PRESS MFG. CO., THE, DIV.-KOEHRING CO.
Marion Rd., Mt. Gilead, O. (Tel. 35)
Dir.-Purch.: Carl A. Fisher
Gen. Sales Mgr.: E. L. Oehling
GS, GE

HYDRO MOLDING CO. INC.
100 Sharron Ave., Plattsburgh, N. Y. (Tel. 2598)
V. P.-Purch.: M. A. Rabin
MF, PS, GS, GE, TR

HYDROMATICS, INC.
70 Okner Pkwy., Livingston, N. J. (Tel. LIvingston 6-4900)
Purch. Agent: Anthony Radice
Sales Mgr.: R. J. Ganther PS, GS

I-L-S INSTRUMENT CORP.
4525 W. 160th St., Cleveland 11, O. (Tel. CLearwater 2-3850)
Purch. Agent: M. E. Saltsgaver
Chief Engr.-Purch.: T. J. Noveske
Sales Mgr.: George R. Lippert
CO, TS

★IDEAL CHEMICAL PRODUCTS, INC.
3813 Hoke Ave., Culver City, Calif. (Tel. TExas 0-4751)
Purch. Agent: J. M. Maddock
V. P.-Research & Dev.: Jerry Gabriel
Sales: Larry Vernon
MF, WN, PS, GE, TS, TR
★(See advertisement in this issue)

IDEAL-AEROSMITH, INC.
3913 Evans Ave., Cheyenne, Wyo. (Tel. 7-7715)
Purch. Agent: F. E. Wheelhouse
Sales Mgr.: Neil Royce
PS, GS, GH, GE, CO, TS

IDEAL INDUSTRIES, INC.
1427 Park Ave., Sycamore, Ill. (Tel. 2114)
Purch. Agent: Dale Chapman
Gen. Sales Mgr.: Gordon B. Koch

IDEAL PRECISION METER CO., INC.
126 Greenpoint Ave., Brooklyn 22, N. Y. (Tel. EVergreen 3-6904)
V. P.: Charles Bernstein
Pres.: Harry Leiderman

ILLINOIS CONDENSER CO.
1616 N. Throop St., Chicago, Ill. (Tel. EV 4-1300)
Purch. Agent: Ted Senelick
Sales Mgr.: L. W. Coleman TR

ILLINOIS TESTING LABORATORIES, INC.
420 N. LaSalle St., Chicago 10, Ill. (Tel. WHitehall 3-1331)
Purch. Agent: J. M. Lajka
V. P.-Sales: M. J. Rauscher
MF, PS, CO, TS

ILLINOIS ZINC CO.
2959 W. 47th St., Chicago 32, Ill. (Tel. LAfayette 3-1600)
V. P.: L. F. Johnson
V. P.: W. F. Synnott MF, PS

ILLUMITRONIC ENGRG. CO.
680 E. Taylor, Sunnyvale, Calif. (Tel. REgent 9-2395)
Purch.: Wm. W. Smith
Sales Mgr.: Joe D. Giulie
MF, PS, GS, GH, GE, TR

IMPACT-O-GRAPH CORP., THE
1900 Euclid Ave., Cleveland, O. (Tel. CHerry 1-5838)
Gen. Mgr.: W. S. Mielziner PS, TS

IMPERIAL BRASS MFG. CO., THE
6300 W. Howard St., Chicago 31, Ill. (Tel. SPring 4-1700)
Purch. Agent: W. B. Burnet
V. P.-Sales Mgr., Distributor Div.: C. H. Benson
V. P.-Sales Mgr., O.E.M. Div.: J. T. Greenlee MF, PS, GS, GE, TS

INDIANA STEEL PRODUCTS CO., THE
Valparaiso, Ind. (Tel. Valparaiso 2-5601)
Purch. Agent: W. F. Eckert
V. P.: I. A. Dickey

INDUCTION HEATING CORP.
181 Wythe Ave., Brooklyn 11, N. Y. (Tel. EVergreen 4-3110)
Dir.-Purch.: Arthur J. Slobin
Sales: Thomas J. Stanton
PS, GS, GH, GE

INDUSTRIAL CONTROL CO.
805 Albin Ave., Lindenhurst, L. I., N. Y. (Tel. MOhawk 1-6060)
Gen. Mgr.: George M. Attura
PS, GE, CO, TS, TR

INDUSTRIAL ELECTRONIC ENGINEERS
3973 Lankershim Blvd., N. Hollywood, Calif. (Tel. POplar 3-7303)
Gen. Mgr.: John E. Hendricks
Sales Mgr.: John J. Bylo
GS, GE, CO, TS, TR

INDUSTRIAL ENGRAVERS INC.
2212 McDonald Ave., Brooklyn 23, N. Y. (Tel. HIckory 9-3200)
Pres.: J. Zatzkin
MF, WN, PS, GE, CO, TS, TR

INDUSTRIAL INSTRUMENTS INC.
89 Commerce Rd., Cedar Grove (Essex Co.), N. J. (Tel. CEnter 9-6200)
Purch. Agent: M. Steinfeld
Sales Mgr.: J. H. Williamson
PS, GS, GH, GE, CO, TS, TR

INDUSTRIAL METAL PROTECTIVES, INC.
401 Homestead Ave., Dayton 8, Ohio (Tel. BAldwin 2-6747)
V. P.-Engrg.: F. R. Fisher, Jr.

INDUSTRIAL MICA CORP.
223 S. Van Brunt St., Englewood, N. J. (Tel. LOwell 8-7200)
Pres.: N. J. Bottie MF, WN, PS, TR

INDUSTRIAL RETAINING RING CO.
57 Cordier St., Irvington, N. J. (Tel. WAverly 6-5000)
Purch. Agent: V. A. Stabile MF, PS

INDUSTRIAL TECTONICS, INC.
3686 Jackson Rd., Ann Arbor, Mich. (Tel. NOrmandy 3-2451); 18301 Santa Fe Ave., Compton, Calif. (Tel. NEvada 6-9941)
Purch. Agent-Ann Arbor: H. G. Fleischman
Purch. Agent-Compton: Ann Del Pesco
Sales Mgr.-Ann Arbor: K. W. McKenzie
PS, GS, GE

INDUSTRIAL TELEVISION INC.
369 Lexington Ave., Clifton, N. J. (Tel. GRegory 3-0900)
Purch. Agent: Joseph Weinberg
Chief Engr.-Purch.: Horace Atwood, Jr.
Sales Mgr.: Robert J. Harrington
GS, GH, GE, TS, TR

INDUSTRIAL WASHING MACHINE CORP.
32 Main St., Matawan, N. J. (Tel. MA 1-4660)
Purch. Agent: J. B. Prelman GS

INDUSTRIAL WIRING & CABLE CO.
103 Foundry St., Wakefield, Mass. (Tel. CRystal 9-3626)
Sales: Joanie MacLaughlin

INDUSTRIAL-ELECTRICAL WORKS
1509 Chicago St., Omaha, Nebr. (Tel. AT 4600)
Purch. & Sales: J. Costello

★INERTIA SWITCH DIV., SAFE LIGHTING INC.
527 Lexington Ave., New York 17, N. Y. (Tel. PLaza 5-1583)
Purch. Agent: Donald C. Wilson
Sales: Dana A. Griffin
★(See advertisement in this issue)

INFRARED INDUSTRIES INC.
163 Highland Ave., Needham Hts. 94, Mass. (Tel. HI 4-7880)
Purch. Agent: W. E. Standring

INGERSOLL KALAMAZOO DIV., BORG-WARNER CORP.
1810 N. Pitcher St., Kalamazoo, Mich. (Tel. FIreside 5-3501)
Dir.-Proc.: Harry E. Morse, 230 E. Water St., Kalamazoo, Mich. (Tel. FIreside 2-0136)
Purch. Agents: L. A. Potratz & E. M. Anderson, 230 E. Water St.
Buyers: E. J. Ries & L. D. Payne, 230 E. Water St.
Dir.-Defense Sales: A. S. Mrozek

INSCO CO., DIV.-BARRY CONTROLS INC.
Hollis St., Groton, Mass. (Tel. GIlbert 8-6358)
Gen. Mgr.: David L. Ammen
PS, GS, TS

INSTRU-LEC CORP.
520 Homestead Ave., Mt. Vernon, N. Y. (Tel. MOunt Vernon 8-3754)
Asst. to Pres.: H. Griesemer PS, GS

INSTRUMENT DEVELOPMENT LABS., INC.
67 Mechanic St., Attleboro, Mass. (Tel. ATtleboro 1-3880)
Purch. Agent: William Pendergast
Buyer: Robert V. Comstock
Expediter-Receiver: John R. Levesque, Jr.
Purch. Dept. Gen.: Shirley R. McCracken
Sales Mgr.: George P. Bentley
GH, GE, CO, TS, TR

INSTRUMENT ELECTRONICS CORP.
P. O. Box 830, Port Washington, N. Y. (Tel. POrt Washington 7-4242)
Pres.: E. Huckenbeck TS

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

INSTRUMENT LABS.
315 W. Walton Place, Chicago 10, Ill.
Purch.: Kay Neal **GE, CO, TS, TR**

INSTRUMENT MOTORS
375 Colt St., Irvington, N. J. (Tel. ESsex 4-9880)
Sales Mgr.: D. Winston
PS, GS, GE, TS, TR

INSTRUMENTS CORP., THE
Central Ave., Baltimore 2, Md. (Tel. DIckens 2-2626)
Purch. Agent: T. E. Bauer
Sales Mgr.: Wm. J. Graves
PS, GS, GE, CO, TS, TR

INSTRUMENTS DIV.-PHILIPS ELECTRONICS, INC.
750 S. Fulton Ave., Mt. Vernon, N. Y. (Tel. MO 4-4500)
Publicity Dept.: Vern W. Palen

INSTRUMENTS FOR INDUSTRY, INC.
150 Glen Cove Rd., Mineola, N. Y. (Tel. Pioneer 2-5300)
Purch. Agent: John T. Daley
Buyer: Frank Catucci
V. P.-Sales: George W. Fellendorf
GE, CO, TS

INSUL-8-CORP., ELECTRONICS DIV.
1369 Industrial Rd., San Carlos, Calif. (Tel. LYtell 3-8003)
Plant Mgr.-Purch. Agent: Donald Scofield
Sales Mgr.-E. Div.: John R. Baker

INTERCONTINENTAL DYNAMICS CORP.
170 Coolidge Ave., Englewood, N. J. (Tel. LOwell 7-3600)
Purch. Agent: Harold White
Sales Mgr.: F. M. Winnai

★INTERELECTRONICS CORP.
2432 Grand Concourse St., New York 58, N. Y. (Tel. LUdlow 4-6200)
Purch. Agent: M. L. Lewis
Sales Mgr.: M. H. Pintell
PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

INTERFERENCE MEASUREMENT LABORATORY, INC.
907 E. 51st St., Brooklyn 3, N. Y. (Tel. INgersoll 9-1765)
Purch. Agent: E. N. Sands
GS, GE, TR

INTERLAKE STAMPING CORP.
12415 Euclid Ave., Cleveland 6, Ohio (Tel. SWeetbriar 1-7101)
Pres.: Wayne Groenstein
V. P.: Robert Livingston **MF, WN**

INTERNATIONAL AEROCOUSTICS CORP.
341 Jackson Ave., New York 54, N. Y. (Tel. CYpress 2-0180)
Purch. Agent: Les Braverman
Buyers: C. Spitalnic, B. Horowitz, A. De Angelis
Sales: M. Hirschorn **PS, GS, GH, TS**

INTERNATIONAL BALSA CORP.
96-100 Boyd Ave., Jersey City 4, N. J. (Tel. HEnderson 4-2044)
Exec. V. P.: Prem Gary

INTERNATIONAL CRYSTAL MFG. CO. INC.
18 N. Lee St., Oklahoma City 2, Okla. (Tel. REgent 6-3741)
Purch. Agent: Frank Watson
Prod. Mgr.: P. M. Freeland
GS, GH, GE

INTERNATIONAL ELECTRIC INDUSTRIES, INC.
468 Grand Ave., Brooklyn 38, N. Y. (Tel. NEvins 8-0211)
Purch. Agent: William Auslander
Chief Engr.-Purch.: John H. Tanges, Jr.
Sales Mgr.: Leo Margold
MF, PS, GS, GH, GE, CO, TS, TR

INTERNATIONAL ELECTRONIC RESEARCH CORP.
145 W. Magnolia Blvd., Burbank, Calif. (Tel. VIctoria 9-2481)
Purch. Agent: Merrill Stuart
Sales Mgr.: John E. Markley, Jr. **TR**

INTERNATIONAL FERMONT MACHINERY CO., INC.
Ramapo, N. Y. (Tel. SLoatsburg 3-2791)
V. P.-Purch.: David Rohr
Dir.-Engrg.: Irwin West
Dir.-Sales: Cecil Sugarman
PS, GS, GH, GE

INTERNATIONAL PUMP & MACHINE WORKS
81 Dorsa Ave., Livingston, N. J. (Tel. LIvingston 6-0660)
Purch.: T. John Scala & Fred E. Roth
PS, GS, GH, GE, CO

INTERNATIONAL RADIANT CORP.
111 New York Ave., Westbury, N. Y. (Tel. EDgewood 4-8820)
Purch. Agent: Robert J. Messina
Sales: Karl D. Klein **GS, TS**

INTERNATIONAL RADIO & ELECTRONICS CORP.
S. 17th & Mishawaka Rd., P. O. Box 261, Elkhart, Ind. (Tel. 2-8385)
Purch. Agent: Lloyd E. Dissmore
Purch. Dept. for Test Equip.: Hilmer C. Lindahl
Mgr.-Sales: Clarence C. Moore

INTERNATIONAL RESEARCH ASSOCIATES
2221 Warwick Ave., Santa Monica, Calif. (Tel. EX 4-6330)
Pres.: Lewis E. Brown
GS, GE, CO, TS

INTERNATIONAL TELEPHONE & TELEGRAPH CORP.
67 Broad St., New York 4, N. Y.

INTERNATIONAL WAX REFINING CO.
99 E. Hawthorne Ave., Valley Stream, N. Y. (Tel. LOcust 1-2500)
Purch.: Frank W. Clarke **MF, WN, PS**

INTERNATIONAL WIRE & CABLE CO.
520 N. Michigan Ave., Chicago 11, Ill. (Tel. MIchigan 2-5850)
Sales Mgr.: Sidney Gracen

INTERSTATE ELECTRONICS CORP.
707 E. Vermont Ave., Anaheim, Calif. (Tel. PRospect 4-6540)
Purch. Agent: Ben V. Hurd
Mgr., Engrg. Liaison: John P. Hastings
PS, GS, CO, TR

INVESTMENT CASTING CO.
60 Brown Ave., Springfield, N. J. (Tel. DRexel 6-6260)
Purch. Agent: Edwin Schoffman
Sales Mgr.: E. H. Parris **MF, PS**

INVO SPLINE, INC.
2357 E. Nine Mile Rd., P. O. Box 25, Hazel Park, Mich. (Tel. SLocum 7-8840)
Pres.: Walter E. Dalby **PS, GS**

IRON FIREMAN MFG. CO., ELECTRONICS DIV.
2838 S. E. 9th Ave., Portland 2, Ore. (Tel. BEmont 4-6551)
Purch. Agent: A. D. Rolfe
Asst. Purch. Agent: Harold Walker
Sales Mgr.: W. D. Gibson
PS, GS, GH, GE, CO, TS, TR

IRVING AIR CHUTE CO., INC.
1315 Versailles Rd., Lexington, Ky. (Tel. 4-6910); Research & Dev. Ctr., 622 Rodier Dr., Glendale 1, Calif. (Tel. CItrus 4-8623)
Comptroller: Y. J. Riverio
Exec. V. P.-Purch.: C. H. Pulley
V. P.-Purch. (Glendale): A. E. Smith
Chief Engr. (Glendale): Kenneth E. French
Sales: J. B. Mauldin, 1631 K St., N. W., Rm. 213, Washington, D. C. (Tel. MEtropolitan 8-0874) **GS, GH, GE**

ISOLANTITE MFG. CORP.
175 Warren Ave., Stirling, N. J. (Tel. MIllington 7-0385)
Pres.: Frank J. Stevens
MF, WN, PS, GS, GE, TS, TR

J-V-M MICROWAVE CO.
4633 Lawndale Ave., Lyons, Ill. (Tel. LYons 3-7990)
Purch.: Arthur Dreusicke & Leo Rzeminski, 8846 W. 47th St., Brookfield, Ill. (Tel. HUnter 5-9580)
Sales: Robert E. Morgan

JACK & HEINTZ, INC.
17600 Broadway, Maple Heights, O.
Mailing: Cleveland 1, O. (Tel. MOntrose 2-1000)
Purch. Agent: Hugh W. Lloyd
Buyers: Edward H. Greer, Arthur P. Grant, George P. Novak, H. Clinton Taylor & Kenneth W. Blauman
Mgr.-Material: Paul J. Barensfeld
Asst. Buyer: Robert J. Sabatka
V. P.-Sales: R. J. Eschborn

JACOBSON NUT MFG. CORP.
Box 177, Kenilworth, N. J. (Tel. MUrdock 6-0200)
Purch. Agent: Joe Marone
Sales Mgr.: C. W. Aagaard **MF, PS**

JAIDINGER MFG. CO., INC.
1921 W. Hubbard St., Chicago 22, Ill. (Tel. HA 1-1090)
Purch. Agent: Robert Krajei
Chief Engr.: C. J. Hackett
Sales: J. H. Jaidinger **GE**

JAMES, POND & CLARK, INC.
2181 E. Foothill Blvd., Pasadena, Calif. (Tel. SYcamore 3-9195)
Purch. Agent: William Olsen
Sales Mgr.: P. F. Shepherd **PS, GS**

JAMESBURY CORP.
45 New St., Worcester, Mass. (Tel. SWift 9-4167)
Treas.-Purch.: Saul I. Reck
Sales: Julian S. Freeman **PS**

JAMISON COLD STORAGE DOOR CO.
Box 70, Hagerstown, Md. (Tel. RE 3-3100)
Gen. Sales Mgr.: P. J. Duffy

JAN HARDWARE MFG. CO., INC.
75 N. 11th St., Brooklyn 11, N. Y. (Tel. EVergreen 7-3300)
Chief Engr.: H. Frieman
Sales: Oscar S. Swarth
MF, WN, PS, GS, GH, GE, CO, TS, TR

JANCO CORP.
3111 Winona Ave., Burbank, Calif. (Tel. THornwall 8-5792)
Purch. Agent: Lester Jones
V. P.-Sales: J. T. Peterson, Jr.
GS, GE, CO, TS, TR

★JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
400 Dublin Ave., Columbus 15, O. (Tel. CApital 1-6492)
Purch. Agent: R. H. Rupp
Buyers: W. Higgins, J. Roberts & John Huntley
Sales Mgr.: J. W. Ashby
MF, PS, GS
★(See advertisement in this issue)

WALTER K. JAROS, AIRCRAFTERS
48-00 Astoria Blvd., S., Astoria, Long Island City, N. Y. (Tel. YEllowstone 2-1400)

Purch. Agent: Josephine K. Jaros
Sales Mgr.: Walter K. Jaros
MF, WN, PS, GS, GH, GE, TS, TR

JARRELL-ASH CO.
26 Farwell St., Newtonville 60, Mass. (Tel. DEcatur 2-2130)
Purch. Agent: W. Jokinen TS

JAVELIN AIRCRAFT CO. INC.
1405 S. Oliver, Wichita 17, Kans. (Tel. MU 2-0111)
Pres. & Chief Engr.: D. D. Blanton
MF, WN, GE

JEFFERSON ELECTRONIC PRODUCTS CORP.
322 State St., Santa Barbara, Calif. (Tel. WOodland 5-8505)
Purch. Agent: Jon E. Brown
Buyer: Frank E. Brackett
Sales: A. K. Sedgwick
GS, GH, GE, TS, TR

JEFFERSON PRODUCTS CORP.
Pleasant Valley Rd., Sutton, Mass. (Tel. Millbury Union 5-4447)
Gen. Mgr.: Michael Friedman

JENNINGS RADIO MFG. CORP.
970 McLaughlin Ave., San Jose, Calif. (Tel. CYpress 2-4025)
Purch. Agent: Howard A. Coon
V. P.-Sales: Calvin K. Townsend
GE, TS, TR

JET TOOL CORP.
7952 North Ave., Lemon Grove, Calif. (Tel. HOpkins 6-0471)
Pres.: Grant Hadley
MF, WN, PS, GS

JOCLIN MFG. CO.
Lufbery Ave., Wallingford, Conn. (Tel. COlony 9-8708)
Purch. Agent: S. F. DiGiorgi
Sales Mgr.: David R. Lurie
MF, WN, PS, GS, GH, GE, TR

JODEE PLASTICS CO.
3089 Fulton St., Brooklyn 8, N. Y. (Tel. APplegate 7-9199)
Treas.: Nicholas Meglino

JOHNS-MANSVILLE DUTCH BRAND DIV.
7800 Woodlawn Ave., Chicago 19, Ill. (Tel. SAginaw 1-1000)
Purch. Agent: J. F. Swart
Asst. Purch. Agent: J. C. Eyster
V. P.-Gen. Mgr.: E. F. Boyle

E. F. JOHNSON CO.
206 2nd Ave., S. W. Waseca, Minn. (Tel. 990)
Purch. Agent: M. L. Johnson
Gen. Sales Mgr.: E. T. Herbig
MF, WN, PS, GS, GH, GE, CO, TS, TR

K. W. JOHNSON & CO., INC.
1825 Webster St., Dayton, O. (Tel. BA 4-0441)
Purch. Agent: Richard D. Tobey
MF, PS, GH, GE, CO, TR

JOHNSON ELECTRONICS INC.
P. O. Box 1675, Casselberry, Fla. (Tel. MIdway 4-3311)
V. P.: R. L. Weber
Sales Mgr.: Nicholas K. Yost
GS, GE, TR

JOHNSON MFG. CO., INC.
616 First Ave., N., Mt. Vernon, Iowa (Tel. 3651)
Sales: R. H. Thompson MF, GE, TR

JOHNSON METAL HOSE, INC.
10 Sperry, Waterbury 20, Conn. (Tel. PLaza 6-4612)
Pres.: N. J. Johnson MF, PS, GS

JOHNSON-WILLIAMS, INC.
2625 Park Blvd., Palo Alto, Calif. (Tel. DAvenport 3-4131)
Mgr.: P. L. Williams
Chief Engr.: K. W. Johnson
GS, CO, TS

JOHNSTON FOIL MFG. CO.
6106 S. Broadway, St. Louis 11, Mo. (Tel. HUdson 1-7000)
Purch. Agent: C. M. Stanek
Gen. Sales Mgr.: A. B. Christine

JOHNSTON & FUNK TITANIUM CORP.
Kemrow Ave., Wooster, O. (Tel. HOward 2-7050)
Purch. Agent: Don Good
Sales Coordinator: Conard Stitzlein
MF, PS

HERRICK L. JOHNSTON, INC.
659 Marion Rd., Columbus 7, Ohio (Tel. KIckory 3-7434)
Purch. Agent: John W. Dalgarn
Dir.-Mfg.: G. A. Wright
MF, PS, GS, GH, TS

HOWARD B. JONES DIV.-CINCH MFG. CORP.
1026 S. Homan Ave., Chicago 24, Ill. (Tel. NEvada 2-2000)
Purch. Agent: Tom Hopkins
Sales Mgr.: C. W. Nelson
GS, GH, GE, TR

JONES & LAMSON MACHINE CO.
160 Rocket St., Springfield, Vt. (Tel. TUrner 5-2121)
Purch. Agent: E. F. St. Mary
Asst. Purch. Agent: Frank Barter
Mgr.-Marketing: H. A. Finch
MF, WN, PS, GS, GH, TS, TR

JORDAN ELECTRONICS, DIV.-VICTOREEN INSTRUMENT CO.
3025 W. Mission Rd., Alhambra, Calif. (Tel. CUmberland 3-6425)
Purch. Agent: G. W. Egan
Buyer: Louis Kroot
Sales Mgr.: William W. Blalock

JOY MFG. CO.
333 Oliver Bldg., Pittsburgh 22, Pa. (Tel. GRant 1-2140) PS, GS, GH, GE

JOYCE CRIDLAND CO., THE
2027 E. First St., Dayton, O. (Tel. CL 3-2131)
Chief Purch. Agent: R. U. Park
Asst. to Sales Mgr.: Earl R. Cox GS

JULIE RESEARCH LABS. INC.
556 W. 168th St., New York City, N. Y. (Tel. LOrraine 8-8700)
Purch.: Mrs. G. Bunt
Sales: Frank Bradley RE

GEO. E. KAERCHER CO.
4911 36th Ave., S., Minneapolis 17, Minn. (Tel. PArkway 4-4986)
Purch.: Don Kaercher & Geo. Kaercher

KAHLE ENGRG. CO.
1307 7th St., N. Bergen, N. J. (Tel. UNion 7-6500)
Purch. Agent: Max Ulmer
Sales Engr.: James B. Lindsay GS

★KAHN & CO., INC.
541 Windsor St., Hartford, Conn. (Tel. CHapel 6-7431)
V. P.-Purch.: Kenneth O. Jacobs
Asst. Purch. Agent: James Melo
Expediter: Richard Metcalf
Sales Mgr.: Robert Hamerschlag
★(See advertisement in this issue)

KAHN RESEARCH LABS., INC.
22 Pine St., Freeport, N. Y. (Tel. FReeport 9-8800)
Purch. Mgr.: Judy Wisner
V. P.-Sales: Kenneth B. Boothe
GE, TR

KAISER AIRCRAFT & ELECTRONICS, DIV.-KAISER INDUSTRIES CORP.
P. O. Box 1828, Oakland 4, Calif. (Tel. San Leandro, Calif.—LOckhaven 2-2456)
Material Mgr.-Richmond Machining Plt.: James Tallman (Tel. Richmond, Calif.—LAndscape 6-4688)
Purch. Agent-San Leandro Plt.: R. A. Peterson (Tel. San Leandro—LOckhaven 2-2456)
Purch. Agent-Toledo Electronics Plt.: R. W. Gibson (Tel. Toledo, O.—RAndolph 6-1591)
Purch. Agent-Phoenix Electronics Plt.: Ralph Musbach (Tel. Phoenix, Ariz.—WIndsor 3-3431)
Sales Engr.-Richmond Machining Plt.: Ralph Prescott (LAndscape 6-4688)
Sales Engr.-San Leandro Plt.: R. G. Coffman (LOckhaven 2-2456)
MF, WN, PS, GS, GH, GE, CO, TS, TR

KAISER ALUMINUM & CHEMICAL SALES, INC.
919 N. Michigan Ave., Chicago 11, Ill. (Tel. MOhawk 4-6900) MF, PS, GH

KAISER STEEL CORP., FABRICATING DIV.
7301 Telegraph Rd., Los Angeles 22, Calif. (Tel. RAymond 3-5411)
Purch. Agent: Frank E. Cooper
V. P.-Gen. Mgr.: Jack J. Carlson
GS, GH, TS

KANO LABS.
1000 S. Thompson Lane, Nashville, Tenn. (Tel. ALpine 4-3519)
Purch.: Thomas J. O'Kane
Sales Mgr.: C. G. Montgomery
MF, WN, PS, GS

KANTHAL CORP., THE
Amelia Place, Stamford, Conn. (Tel. DAvis 5-2206)
Chief Engr.: F. J. Barto
Sales Mgr.: G. W. Eisenbeis

A. LAWRENCE KARP
16 Putnam Park, Greenwich, Conn. (Tel. TOwnsend 9-8144)
Purch.: A. L. Karp

KASAR MFG. & DISTRIBUTING CO., INC.
9905 W. Jefferson Blvd., Culver City, Calif. (Tel. TExas 0-5591)
Purch. Agent: William Robertson
Buyers: Paul Roberts, Ed Anderson
MF, WN, PS, GS, GE, TR

KAY ELECTRIC CO.
Maple Ave., Pine Brook, N. J. (Tel. CAldwell 6-4000)
Purch. Agent: Marsden Shaw
Gen. Sales Mgr.: John Gilmore
MF, PS, GS, GH, GE, CO, TS, TR

KAYDON ENGRG. CORP., THE
McCracken St., Muskegon, Mich. (Tel. 5-1641)
Dir.-Purch.: W. J. Pierre
Buyers: John L. Peterson, Robert Stevens
PS, GS, GH, GE

JOSEPH KAYE & CO.
49 Hampshire St., Cambridge 39, Mass. (Tel. UNiversity 4-1386)
Joseph Kaye
MF, WN, PS, GS, GE, TR

KAYNAR MFG. CO., INC.
7875 Telegraph Rd., Rivera, Calif.
Mailing Add.: P. O. Box 2001 Terminal Annex, Los Angeles 54, Calif. (Tel. LUdlow 9-3271)
Purch Agent: George Mooers
Serv. Engr.: R. H. Randall

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

KEARFOTT CO., INC., LITTLE FALLS, N. J.
1378 Main Ave., Clifton, N. J. (Tel. GRegory 2-1000)
Dir.-Sales: F. J. Delves
MF, WN, PS, GS, GE, CO, TS, TR

KEIL ENGRG. PRODUCTS
4356 Duncan Ave., St. Louis 10, Mo. (Tel. OLive 2-7005)
Purch.: Edward W. Keil, 6833 Manchester Ave., St. Louis, Mo. (Tel. STerling 1-3209)
Sales Mgr.: N. W. Kathrinus
MF, GE, TR

KEITHLEY INSTRUMENTS, INC.
12415 Euclid Ave., Cleveland, Ohio (Tel. SWeetbriar 5-2666)
Works Mgr.: N. J. Wagner
V. P.-Research: Julius Praglin
V. P.-Engrg.: W. E. Koeblitz

KELLETT AIRCRAFT CORP.
Box 35, Willow Grove, Pa. (Tel. OSborne 5-2930)
Purch. Agent: Howard Harner, Jr.
Asst. Purch. Agent: Roland Nevin
V. P.-Sales: I. Medgebow
MF, PS, GH, TS, TR

M. W. KELLOGG CO., THE
Foot of Danforth Ave., Jersey City 3, N. J. (Tel. DElaware 3-3100)
Mgr.-Plant Purch.: T. B. Rees
Buyers: J. O. Dalstrom, J. E. Wallis, H. F. Perkins & W. H. Pierre
Mgr.-Prod. Parts Sales: J. O. Wagner

KELSEY-HAYES CO.
3600 Military Ave., Detroit 32, Mich. (Tel. TAshmoo 5-5500)
Dir.-Purch. & Planning: W. L. Troutfetter
Gen. Mgr.-Aviation Divs.: Leslie G. Taylor
MF, WN, PS, GS, GH, GE, TS, TR

KELVIN ELECTRIC CO.
5907 Noble Ave., Van Nuys, Calif. (Tel. STate 2-6662)
Purch. Agent: Kenneth T. Eckardt

KEMLITE LABORATORIES, INC.
1819 W. Grand Ave., Chicago 22, Ill. (Tel. TAylor 9-6050)
Purch. Agent: O. H. Floyd
MF, WN, PS, GS, GE, TS, TR

KEMP AERO PRODUCTS, DIV.-KEMP INC.
127 Porete Ave., North Arlington, N. J. (Tel. KEarny 3-5019)
Gen. Mgr.: James Harrington
Purch. Agent: Edward Conlon

KEMP INC.
129 Porete Ave., N. Arlington, N. J. (Tel. KEarny 3-5018)
Gen. Mgr.: James Harrington
Purch. Agent: Edward Conlon
MF, WN, PS, GS, GE

KENNAMETAL INC.
One Lloyd Ave., Latrobe, Pa. (Tel. KEystone 7-3311)
Purch. Agent: Dale R. Versaw
Sales Mgr.: Bennett Burgoon, Jr.
MF, PS, GS, GE

D. S. KENNEDY & CO.
155 King St., Cohasset, Mass. (Tel. COhasset 4-1200)
Purch. Agent: Rober Fisher
V. P.-Sales: C. W. Creaser
GS, GH, GE, TR

KENTUCKY METAL PRODUCTS CO.
3104 Preston Hwy., Louisville, Ky. (Tel. MElrose 4-9421)
Purch. Agent: Gene Burton
Engr.: J. L. Covert

KEPCO LABS. INC.
131-38 Sanford Ave., Flushing, N. Y. (Tel. INdependence 1-7000)
Purch. Agent: Jack Kupferberg
Sales Mgr.: Max Kupferberg
PS, GS, GH, GE, TR

KERNS MFG. CORP.
45-18 Court Sq., Long Island City 1, N. Y. (Tel. STillwell 6-2550)
Purch. Agent: Arnold Novak
Engrg. Sales Mgr.: Robert J. Carbone
MF, WN, PS

KEY RESISTOR CORP.
321 W. Redondo Beach Blvd., Gardena, Calif. (Tel. DAvis 3-5000)
Chief Engr.: J. L. Goforth
GS, GH, GE, TR

KEYSTONE CARBON CO.
1935 State St., St. Marys, Pa. (Tel. TE 4-1591)
Purch. Agent: Leo Schaut
Sales: E. J. Crowe
WN, PS, GS, GH, GE, TR

KEYSTONE ELECTRONICS CORP.
49 Bleecker St., New York 12, N. Y. (Tel. GRamercy 5-4600)
Purch.: I. Rosen
MF, PS, GS, GH, GE, TS, TR

KEYSTONE PRODUCTS CO.
904-6 23rd St., Union City, N. J. (Tel. UNion 6-5400)
Purch. Agent: James A. Ollick
Sales Mgr.: R. E. Mottola
GS, GE, TS

KICKHAEFER MFG. CO.
901 S. Second St., Milwaukee 4, Wisc. (Tel. MItchell 5-1630)
V. P.-Purch.: Ernest Davis
PS, GH, TS, TR

WALTER KIDDE & CO., INC., AVIATION DIV.
1320 Main St., Belleville 9, N. J. (Tel. PLymouth 9-5000)
Dir.-Purch.: E. R. Randall
Purch. Agent: John P. Blake
Asst. Purch. Agents: J. D. Tamburro, H. S. Klimoski
Buyers: S. Stefans, S. Eckhouse
Asst. V. P.-Sales: A. H. Hobelmann
MF, PS, GS, GH, GE, CO, TS

KILGEN AIRCRAFT DIV.-THE KILGEN ORGAN CO.
4632 W. Florissant Ave., St. Louis 15, Mo. (Tel. COlfax 1-2000)
Purch. Agent: Frank Oswald
V. P.-Sales: Eugene R. Kilgen
PS, GS, GH, GE, CO, TS

KILGORE, INC., INTERNATIONAL FLARE-SIGNAL DIV.
200 E. Broadway, P. O. Box 31, Westerville, O. (Tel. TUxedo 2-2341)
Purch. Agent: W. D. Watkins
Sales Mgr.-International Flare-Signal Div.: G. J. Bishop **PS**

KIN TEL DIV.-COHU ELECTRONICS, INC.
5725 Kearny Villa Rd., San Diego 11, Calif. (Tel. BR 7-6700)
Purch. Agent: Wade Gilliland
Asst. Sales Mgr.: Stanley S. Sievers
GS, GE, CO, TS, TR

KINEVOX-HALLEN
1646 18th St., Santa Monica, Calif. (Tel. EXbrook 5-9975)
Mgr.-Purch.: G. B. Blackwell
Prod. Mgr.: Robert L. Lane
Chief Engr.: Robert Watts
Engrg. Sales: H. L. Powell
GS, GH, GE, TS, TR

KLINCHER LOCKNUT CORP.
2153 Hillside Ave., Indianapolis 18, Ind. (Tel. WAlnut 5-9284)
Purch. Agent: Mrs. Jean Groseclose
Engr.-Purch.: James D. Anderson
Sales Mgr.: I. J. Dienhart **MF, PS**

KLING METAL SPINNING & STAMPING CO.
245-247 Centre St., New York 13, N. Y. (Tel. CA 6-5580)
Owner: Philip Kling **MF, WN, PS, GE**

RICHARD KLINGER INC.
550 4th Ave., Brooklyn 15, N. Y. (Tel. SOuth 8-6747)
Purch.-Sales Mgr.: R. C. Soukup
Asst. Purch.-Sales Mgr.: S. Shabman

JAMES KNIGHTS CO., THE
Sandwich, Ill. (Tel. 2141)
Purch. Agent: Russell E. Wahlgren
GS, GE, TR

H. KOCH & SONS
P. O. Box 125, Corte Madera, Calif. (Tel. WAbash 4-3510)
Purch. Agent: H. Salkin
Gen. Mgr.: M. P. Koch **PS, GS**

KOEHLER AIRCRAFT PRODUCTS CO., INC.
409 Leo St., Dayton 4, O. (Tel. BAldwin 6-1821)
Purch. Agent: Betty Jackowitz
V. P.-Gen. Mgr.: Richard M. Johnson
V. P.-Chg. Future Dev.: Gordon T. Koehler
Sales Mgr.: Robert J. Hostetter
MF, PS, GS, GE

KOHLER CO.
Kohler, Wisc. (Tel Sheboygan, Wisc.-GL 7-4441)
Sales Mgr.: A. G. Zibell **PS, GS**

KOILED KORDS INC.
1565 Dixwell Ave., New Haven 14, Conn. (Tel. CHestnut 8-5515)
Purch. Agent: D. C. McKean
V. P.-Sales: E. L. Love **MF**

KOLLSMAN INSTRUMENT CORP., SUB.-STANDARD COIL PRODUCTS CO. INC.
80-08 45th Ave., Elmhurst 73, N. Y. (Tel. TWining 9-5600)
Purch. Agent: J. Goodrich
Gen. Sales Mgr.: W. C. Bonn

KOLTON ELECTRIC MFG. CO.
123 New Jersey Railroad Ave., Newark 5, N. J. (Tel. MItchell 2-4622)
Purch.: C. Kolton
Sales: H. Kolton
MF, PS, GS, GH, GE, TR

★KOONTZ-WAGNER ELECTRIC CO., INC.
516 N. Michigan St., South Bend 1, Ind. (Tel. CEntral 3-8251)
Procurement Mgr.: A. W. Koehnke
Gen. Mgr.: C. D. Hills
Production Mgr.: C. H. Bill
V. P.-Sales: B. Kumm **PS, GE**
★(See advertisement in this issue)

KOPP GLASS, INC.
Swissvale, Pittsburgh 18, Pa. (Tel. BRandywine 1-0190)
Purch. Agent: Charles Rudek
V. P.-Sales: J. L. Newton **GS, GE**

KOPPERS CO., INC.
Koppers Bldg., Pittsburgh, Pa. (Tel. EXpress 1-3300)
V. P.-Purch.: P. D. Shollar
Sales Mgr.-Chem. Div.: J. W. Pool

KOPPERS CO., INC., METAL PRODUCTS DIV.
200 Scott St., Baltimore 3, Md. (Tel. SAratoga 7-2500)
Mgr.-Procurement Dept.: B. K. Shaner
Asst. Mgr.-Procurement Dept.: J. Kalista
Buyer: D. Koerin
Subcontracting: G. Fromm
Sales Mgr.: H. P. Neher **MF, PS, TS**

HERB KRECKMAN CO.
Cresco, Pa. (Tel. 2212)
Herb Kreckman

KRYLON, INC.
Ford & Washington Sts., Norristown, Pa. (Tel. BRoadway 9-1950)
Purch. Agent: William Sansalone
V. P.-Sales: Richard C. Newbold
MF, WN, GS, GE, TR

KULKA ELECTRIC CORP.
633 S. Fulton Ave., Mt. Vernon, N. Y. (Tel. MOunt Vernon 4-4024)
Purch. Agent: Harry Meltzer
Buyer: Elliott Edelman
Treas.-Sales: William Kulka
MF, PS, GS, GH, GE, CO, TS, TR

KURMAN ELECTRIC CO., DIV.-NORBUTE CORP.
191 Newel St., Brooklyn 22, N. Y. (Tel. EVergreen 3-8000)
V. P.-Purch.: Julian Goodstein
Purch. Agent: Jim Barry
Sales Mgr.: Wallace Green GE

KURZ & ROOT CO.
232 E. North Island St., Appleton, Wisc. (Tel. REgent 3-6641)
Purch. Agent: Carl Abig
V. P.-Sales: Eli Chappe

KURZ-KASCH, INC.
1421 S. Broadway, Dayton, O. (Tel. BAldwin 3-8161)
Purch. Agent: I. H. Naas
Sales Mgr.: R. L. Davidson MF

KWIKHEAT MFG. CO.
3732 San Fernando Rd., Glendale 4, Calif. (Tel. CHapman 5-2376) GS

L. A. B. CORP.
Skaneateles 1, N. Y. (Tel. SKaneateles 1161)
Purch. Agent: H. B. Mantz
Sales Mgr.: J. T. Hubbard TS

L. O. F. GLASS FIBERS CO.
3116 Van Owen Blvd., Burbank, Calif. (Tel. VIctoria 9-2331)
Purch. Agent: Robert O. Eiseld
Sales Mgr.: Wm. Worcester
MF, WN, PS, GS, GE, TR

LABORATORY FOR ELECTRONICS, INC.
75 Pitts St., Boston, Mass. (Tel. RIchmond 2-3200)
Purch. Agent: W. J. Stanton
Asst. Purch. Agent: H. E. Nilson
Chief Mech. Buyer: B. P. O'Sullivan
Chief Electrical Buyer: H. Wilayto
Chief Mill Supply Buyer: H. Tungate
Dir.-Sales: R. K. Mosher TS, TR

LADISH CO.
5481 S. Packard Ave., Cudahy, Wisc. (Tel. HUmboldt 1-1500)
Purch. Agent: J. F. Wachs
Sales Mgr.-Forging Div.: R. F. Starz
MF, WN, PS, GS

LAKE ERIE MACHINERY CORP.
P. O. Box 68, Kenmore Sta., Buffalo 17, N. Y. (Tel. BEdford 6900)
Purch. Agent: G. T. McCrone
Buyer: R. P. Hartmayer
V. P.-Sales: Leo W. Coleman GS

LAMBDA ELECTRONICS CORP.
11-11 131st St., College Point, N. Y. (Tel. INdependence 1-8500)
Purch. Agent: E. Botuck
Exec. V. P.-Sales: Simeon Weston GS

★LAMINATED SHIM CO.
9304 Union St., Glenbrook, Conn. (Tel. DAvis 5-2631)
Purch. Agent: Philip Carleton
V. P.-Sales: M. L. Lockwood
MF, WN, PS
★(See advertisement in this issue)

LAMPKIN LABS., INC.
Bradenton, Fla. (Tel. 6-1906)
Purch. Agent: George C. Craig

LAMSON & SESSIONS CO., THE
5000 Tiedeman Rd., Cleveland 9, O. (Tel. CLearwater 2-3700)
Dir.-Purch.: Frank J. DeCrane
Gen. Sales Mgr.: J. G. Rayburn
MF, PS

LAMTEX INDUSTRIES, INC.
51 State St., Westbury, N. Y. (Tel. EDgewood 3-2680)
V. P.-Sales: Hsing Liu MF, WN, PS

LANCASTER GLASS CORP.
Lancaster, Ohio (Tel. OLive 3-0311)
Purch. Agent: Homer Echard
Sales Mgr.: M. R. Hoover

LAND-AIR, INC., SUB.-CALIFORNIA EASTERN AVIATION, INC.
7444 W. Wilson Ave., Chicago 31, Ill. (Tel. UNderhill 7-7550)
Materials Control Mgr.: C. D. Mitchell
Purch. Asst.: R. Brown
V. P.-Sales & Contracts: A. M. Breit

LANDSVERK ELECTROMETER CO.
641 Sonora Ave., Glendale, Calif. (Tel. CHapman 5-6687)
Div. Mgr.-Comm. Purch.: D. L. Merriner
Div. Mgr.-Contract Purch.: W. R. Hanson
V. P.-Sales: D. L. Collins GE, CO, TS

LANE ELECTRONICS MFG. CORP.
7254 Atoll Ave., North Hollywood, Calif. (Tel. ST 7-3267)
Purch. Agent: Philip A. Mottola
Chief Engr.: Robert J. Schollard
Sales Mgr.: Arden J. Lane

LA POINTE INDUSTRIES INC.
Rockville, Conn. (Tel. TRemont 5-3351)
Purch.: E. Evans
Sales: J. Yule
MF, WN, PS, GS, GH, GE, CO, TS, TR

LAPP INSULATOR CO., INC., RADIO SPECIALTIES DIV.
317 Gilbert St., Le Roy, N. Y. (Tel. 385)
Purch. Agent: Dean H. Lapp
Asst. Purch. Agent: Richard Ladd
Sales Mgr.-Radio Specialties Div.: Sumner P. Lapp
MF, WN, PS, GS, GH, GE, TR

CHARLES E. LARSON & SONS, INC.
2665 N. Keeler Ave., Chicago 39, Ill. (Tel. SP 2-9700)
Purch. Agent: Charles M. Larson
Sales: Richard E. Larson MF

★LAVELLE AIRCRAFT CORP.
Sterling St., Newtown, Bucks County, Pa. (Tel. WOrth 8-3838)
V. P.-Purch.: H. A. Liese
Contracts Mgr.: Frank V. Kiefer
MF, WN, PS
★(See advertisement in this issue)

★LAVEZZI MACHINE WORKS
4635 W. Lake St., Chicago 44, Ill. (Tel. ESterbrook 8-1636)
Purch. Agent: Jerome J. Kremer
Sales Mgr.: Worth Baird
MF, WN, PS, GS
★(See advertisement in this issue)

LAVOIE LABS., INC.
Matawan-Freehold Rd., Morganville, N. J. (Tel. MAtawan 1-2600)
Purch. Agent: G. F. Croddick
Sales Admin.: J. D. Copeland
PS, GS, GE, CO, TS, TR

LAWRENCE PUMPS INC.
371 Market St., Lawrence, Mass. (Tel. MUrdock 2-5249)
V. J. Mill, Jr. GS

LEACH CORP.
Leach Relay Div.
5915 Avalon Blvd., Los Angeles 3, Calif. (Tel. ADams 2-8221)
Dir.-Purch.: A. E. Rose
Inet Div.
18435 Susana Rd., Compton, Los Angeles, Calif. (Tel. NEvada 6-1061)

LEACH & GARNER CO., INDUSTRIAL DIV.
Pearl St., Attleboro, Mass. (Tel. 1-1155)
Purch. Agent: Preston Stevenson
Mgr.-Sales: Gerald F. Tucci
MF, WN, PS, GS, GE, CO, TS, TR

LEAR, INC.
3171 S. Bundy Dr., Santa Monica, Calif. (Tel. EXmont 8-6211)
Purch. Agent-Lear-Romec Div.: W. W. Wilber, Abbe Rd., Elyria, O. (Tel. FAirfax 3-3211)
Mgr.-Purch. Dept.-LearCal Div.: H. E. Switzer (Tel. EXmont 8-6211)
PS, GS, GE, TR

LEAR, INC., GRAND RAPIDS DIV.
110 Ionia Ave., N. W., Grand Rapids, Mich. (Tel. GLendale 1-1555)
Purch. Agent: R. Thies
Div. Contracts Mgr.: K. R. Hahn
WN, PS, GS, GE, CO, TS, TR

LEATHERMAN CO.
13259 Sherman Way, N. Hollywood, Calif. (Tel. STanley 7-9635)
Purch. Agent: Mrs. Jeane Miller
Material Control: Foy R. Albert, Jr.
Chief Engr.: George F. Clark
Sales Mgr.: Bill Cool GS, TS

LEBANON STEEL FOUNDRY
1st Ave. & E. Lehman St., Lebanon, Pa. (Tel. 3-1611)
Gen. Sales Mgr.: John H. Boyd
MF, PS

LEBEC CHEMICAL CORP.
14066 S. Garfield Blvd., Paramount, Calif. (Tel. NEvada 6-3381)
Purch. Agent: E. B. Westall
MF, WN, PS, GS, GE

R. K. LEBLOND MACHINE TOOL CO.
Madison & Edwards Rds., Cincinnati, O. (Tel. JEfferson 1-0910)
Purch. Agent: Wm. McK. Reis
V. P.-Sales: B. N. Brockman MF

LEE CO., THE
Wesley Ave., Westbrook, Conn. (Tel. EXport 9-6228)
Office Mgr.: Charles Muller PS

LEE ELECTRIC & MFG. CO.
2806 Clearwater St., Los Angeles 39, Calif. (Tel. NOrmandy 3-1295)
Purch.: L. P. Tuttle
Sales: Lee V. Lawhead, Jr. GS, GH

WALTER LEE CHEMICAL CORP.
1383 Seabury Ave., Bronx 61, N. Y. (Tel. SYcamore 2-4400)
Purch. Agent: Don Singer
MF, WN, PS, GS, GE, TR

GERARD G. LEEDS CO., INC.
12 Crampton Lane, Great Neck, L. I., N. Y. (Tel. HUnter 2-7784)
Sales Mgr.: Martin Kaplan

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

LEEDS & NORTHRUP CO.
4970 Stenton Ave., Philadelphia 44, Pa. (Tel. DA 9-4900)
Purch.: J. E. Jennings
Mgr.-Sales Engrg.: H. L. Scutt
MF, PS, GS, GH, GE, CO, TS, TR

LEETRONICS, INC.
30 Main St., Brooklyn 1, N. Y. (Tel. ULster 5-7163)
V. P.-Purch.: Walter P. Reading
MF, WN, PS, GS, GE, TS, TR

LEHIGH CHEMICAL CO.
Flatland Rd., Chestertown, Md. (Tel. 730)
Purch. Mgr.: Henry G. Gruber
Sales Mgr.: C. David Haacke
MF, PS, TR

LEIMAN BROTHERS, INC.
166 Christie St., Newark 5, N. J. (Tel. MA 3-7520)
Purch. Agent: Frank Cristo **PS, GS**

LEITCH ENGRG. CORP.
326 Lincoln St., Manchester, N. H. (Tel. NAtional 3-4773)
Purch. Agent-Electronics: H. E. Newell
Sales: D. Robert Leitch **GS, CO, TS**

LEKTRA LABORATORIES, INC.
154 11th Ave., New York 11, N. Y. (Tel. ALgonquin 5-2013)
V. P.-Purch.: B. Eisenberg **CO, TS**

L E L, INC.
380 Oak St., Copiague, L. I., N. Y. (Tel. AM 4-2200)
Purch.: W. Maggio
Sales: R. Mautner **GE, CO, TS, TR**

★LELAND ELECTRIC CO., THE, DIV.-AMERICAN MACHINE & FOUNDRY CO.
1501 Webster, P. O. Box 1060, Dayton 1, O. (Tel. BAldwin 4-0701)
Purch. Agent: Walter Stump, 48 E. National Hwy., Vandalia, O. (Tel. TWin Oaks 8-5881)
Buyers: D. Bechtol & M. Boor
V. P.-Sales: Arthur Pelster **PS**
★(See advertisement in this issue)

G. H. LELAND, INC.
123 Webster St., Dayton 2, O. (Tel. BAldwin 4-9891)
Purch. Agent: Morris M. Wright
Asst. Purch. Agent: H. E. Jacobs
Sales Mgr.: Hans G. Belitz
PS, GS, GE, TR

LENKURT ELECTRIC CO., INC.
1105 County Rd., San Carlos, Calif. (Tel. LYtell 1-8461)
Military Purch. Mgr.: David Steinberg
Military Mktg. Mgr.: Joseph R. Sherman

★WALLACE O. LEONARD, INC.
373 S. Fair Oaks Ave., Pasadena, Calif. (Tel. RYan 1-4446)
Purch. Agent: Arthur W. Foster
Purch. Expeditor: Robert L. Todd
Sales Admin.: Kenneth I. Stubbs
MF, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

LEVINTHAL ELECTRONIC PRODUCTS, INC.
3180 Hanover St., Stanford Industrial Park, Palo Alto, Calif. (Tel. DAvenport 6-1640)
Purch. Agent: Robert H. Shimer
PS, GS, GE, CO, TS, TR

E. B. LEWIS CO., INC.
11 Bragg St., E. Hartford, Conn. (Tel. JAckson 8-0830)
Pres.: Ernest B. Lewis **GS, GE**

LEWIS ENGRG. CO., THE
339 Church St., Naugatuck, Conn. (Tel. PArk 9-5253)
Purch. Agent: M. Forde
MF, PS, GS, GH, GE, CO, TS, TR

LEWIS & SAUNDERS
P. O. Box 73, Lakeport, N. H. (Tel. LAconia 2488)
Gen. Mgr.-Purch.: William W. Saunders
Sales: T. Gary Allen

WARNER LEWIS CO., DIV.-FRAM CORP.
817 N. Lewis Pl., Tulsa, Okla. (Tel. WEbster 9-6386)
Purch. Agent: R. P. Leedy
Sales Mgr.: T. R. Bradley

LIBRASCOPE INC.
808 Western Ave., Glendale, Calif. (Tel. CHapman 5-2677)
Purch. Agent: M. L. Cowen
Purch.-Components: N. Nelson
MF, WN, PS, GS, GE, CO, TS, TR

LICON DIV.-ILLINOIS TOOL WORKS
2501 N. Keeler Ave., Chicago 39, Ill. (Tel. CA 7-2200)
Purch. Agent: Art Froehlic
Prod. Control Mgr.: Ray Salners
Sales: J. O. Roeser **PS, GE**

LICON & SPIROID DIVS., ILLINOIS TOOL WORKS
2501 N. Keeler Ave., Chicago, Ill. (Tel. DA 8-5958)
Purch. Agent: Arthur Froehlich
Div. Mgr.-Sales, Licon: J. Roeser
Sales Mgr., Spiroid: W. MacFarland

LIGHT METALS, INC.
1100 E. 24th St., Indianapolis 5, Ind. (Tel. WAlnut 6-4591)
Purch. Agent: Kenneth R. Goodwin
V. P.-Sales: Thomas H. Hargitt
MF, WN, PS, GH

LINCOLN ELECTRIC CO., THE
22801 St. Clair Ave., Cleveland 17, O. (Tel. IVanhoe 1-8100)
Dir.-Purch.: H. A. Burnip
Exec. V. P.-Sales: J. S. Roscoe
GS, GH

LINDBERG ENGRG. CO.
2450 W. Hubbard St., Chicago 12, Ill. (Tel. MOnroe 6-3443)
Purch. Agent: E. A. Griebe
Sales Mgr.: C. F. Burling **PS, GS, TR**

LINDE CO., DIV.-UNION CARBIDE
30 E. 42nd St., New York, N. Y. (Tel. MU 7-8000)
Mgr.-Mkt. Research & Prom.: S. Hahn
MF, WN, PS

ERIK A. LINDGREN & ASSOCIATES, INC.
4515 N. Ravenswood, Chicago 40, Ill. (Tel. SU 4-0710)
Erik A. Lindgren

LINEAR, INC.
State Rd. & Levick St., Philadelphia 35, Pa. (Tel. MA 4-4700)
Purch. Agent: F. Murphy, Dallas, Pa. (Tel. ORchard 4-1541)
V. P.-Sales: F. A. Lewis

LING ELECTRONICS INC.
9937 W. Jefferson Blvd., Culver City, Calif. (Tel. TExas 0-7711)
Purch.: Frank Burke
Sales: Ralph B. Austrian **TS**

LINK AVIATION, INC.
Hillcrest, Binghamton, N. Y. (Tel. 3-6311)
Purch. Agent: M. B. Bird
Buyers: N. Tatich, F. J. Sabraw & J. F. Clark
V. P.-Sales: L. L. Kelly

LION FASTENER CO., INC.
Lester, Pa. (Tel. LEhigh 4-9600)
Plant Supt.-Purch.: Harold Ollerenshaw
Sales: T. R. Dunlevy **MF**

EDWIN A. LIPPS ENGRG.
1511 Colorado Ave., Santa Monica, Calif. (Tel. EX 3-0449)
Purch. Agent: Ray E. Haney
Prod. Suprvsr.: T. F. Adams
Sales Mgr.: B. D. Lipps

LIQUIDOMETER CORP., THE
41-03 36th St., Long Island City, N. Y. (Tel. STillwell 4-1440)
Purch. Dir.: R. Hogan
V. P.-Sales: H. T. Cullinan
PS, GS, CO, TS, TR

LITHIUM CORP. OF AMERICA, INC.
2500 Rand Tower, Minneapolis 2, Minn. (Tel. FEderal 2-7451)
Dir.-Purch. & Traffic: John W. Douglas
Gen. Purch. Agent: Richard E. Thompson
Purch. Agent: Harlin E. Stoterau, 2400 Dakota Ave., St. Louis Park, Minn. (Tel. LIberty 5-8857)
Purch. Agent: Fred Dixon, Bessemer City, N. C. (Tel. MA 9-2282)
Dir.-Sales: J. D. Campbell (Tel. FE 2-7451)
PS

LITTELFUSE, INC.
1865 Miner St., Des Plaines, Ill. (Tel. VAnderbilt 4-1188)
Purch. Agent: Dave Shean
Dist. Sales Mgr.: Walter A. Clements

LITTON ENGRG. LABS.
P. O. Box 949, Grass Valley, Calif. (Tel. Grass Valley 1730)
Purch. Agent: Mrs. Grace Martz
Gen. Mgr.: F. L. Towne

LITTON INDUSTRIES, COMPONENTS DIV.
5873 Rodeo Rd., Los Angeles 16, Calif. (Tel. VErmont 7-1228)
Purch. Agent: Jack Brophy
Dir.-Sales: R. W. Griffiths

LIVERMONT, INC.
Myrtle & Maple Aves., Monrovia, Calif. (Tel. ELliott 9-2555)
Purch. Agent: J. F. Hubbard
Sales Mgr.: M. McLean

LIVINGSTON ELECTRONIC CORP.
P. O. Box 3, Livingston, N. J. (Tel. CAldwell 6-3333)
Prod.: Charles L. Nolte
Engrg.: R. H. Rose **PS, GE**

LOCKHEED MISSILE SYSTEMS DIV.
Sunnyvale, Calif. (Tel. REgent 9-9611)
Dept. Mgr.: J. B. McChesney
Purch.: M. McGilvray, L. Neuenswander, D. W. Lewis, E. A. Grindle, P. Maggio, C. J. Jennings
Sales Branch Mgr.: R. R. Kearton

LOCKREY CO., THE
P. O. Drawer J, Southampton, N. Y. (Tel. SOuthampton 1-0278)
Sales Mgr.: D. I. McMeekan **PS**

LOEWY-HYDROPRESS, DIV.-BALDWIN-LIMA-HAMILTON CORP.
111 Fifth Ave., New York 3, N. Y. (Tel. ORegon 7-5030)
Purch. Mgr.: John Swanberg
Sales: Frederick F. Fielder & Paul Mayer
MF, PS, GS, GH, TS

LOGETRONICS INC.
500 E. Monroe Ave., Alexandria, Va. (Tel. TE 6-5180)
Prod. Mgr.: William F. Hamilton
Dir.-Sales: Gordon O. F. Johnson **GS**

LONDON CHEMICAL CO., INC.
1535 N. 31st Ave., Melrose Park, Ill. (Tel. AUstin 7-9495)
Purch. Agent: R. I. Schub
Sales Mgr.: K. W. Anderson
MF, PS, GS, GH

★LONE STAR PLASTICS CO. INC.
124 Roberts Cut Off, Fort Worth, Texas (Tel. PE 2-1437)
Purch. Agent: Mrs. Catherine Hare
Sales Mgr.: W. P. Fralia
MF, WN, PS
★(See advertisement in this issue)

THOMAS J. LONG, INC.
215 Stonehinge Lane, Carle Place, L. I., N. Y. (Tel. EDgewood 4-2300)
Buyer: Richard Hartman
Sales Mgr.: Norman A. Terry

LONGREN AIRCRAFT CO., INC.
24751 Crenshaw Blvd., Torrance, Calif. (Tel. NEvada 6-5708)
Mgr.-Materiel: Wm. F. Hodgson
Purch. Agent: James M. Crawford
Buyer: Ervin R. Dew
V. P.-Sales: R. C. Buck MF, WN, PS, GS

LOVEJOY FLEXIBLE COUPLING CO.
4949 W. Lake St., Chicago 44, Ill. (Tel. ES 9-3010)
V. P.-Purch.: C. P. Hennessy
Purch. Agent: Ed Ferguson
V. P.-Sales: W. B. Briggs PS, GS, GH

LUCAS AIRCRAFT SUPPLY CO.
17311 S. Main St., Gardena, Calif. (Tel. FAculty 1-0080)
Gen. Mgr.: Frank E. Briney

LUKENS STEEL CO.
1st Ave., Coatesville, Pa. (Tel. 2000)
Purch. Agent: E. Clair Book
Asst. Purch. Agent: Albert W. Gudal
Buyers: Arthur M. Daggett, John M. Davis, & Donald W. Evans WN, PS, GS, GH

LUMEN, INC.
P. O. Box 905, Joliet, Ill. (Tel. 3-9324)
PS, GS, GE, CO, TS, TR

LUMINATOR, INC.
120 N. Peoria St., Chicago, Ill. (Tel. DE 7-0737)
Purch.: Ray Lewen GS

LUMINOUS RESINS INC.
166 W. Washington St., Chicago, Ill. (Tel. DE 2-4667)
Pres.: W. A. McCallum MF

LUNDEY ASSOCIATES INC.
694 Main St., Waltham, Mass. (Tel. TWinbrook 3-6064)
Purch. Agent: E. J. W. Grenda PS, GE, TR

★LYON VAN & STORAGE CO., AIRCRAFT DIV.
2701 N. Ontario St., Burbank, Calif. (Tel. Victoria 9-3317)
Prod. Mgr.: Deane J. Stevens
Gen. Mgr.: Ralph C. Butler
★(See advertisement in this issue)

LUNN LAMINATES, INC.
Oakwood Rd. & W. 11th St., Huntington Station, N. Y. (Tel. HAmilton 3-7200)
Purch. Agent: Edward W. Kirchner
Pres.: James S. Lunn
MF, PS, GS, GH, GE, TS, TR

LURIA ENGRG. CO.
1745 Eaton Ave., Bethlehem, Pa. (Tel. UNiversity 7-4651)
Purch. Agent: C. E. Topping
Asst. to Purch. Agent: R. R. Bergenstock
Buyers: C. A. Moyer & D. S. Luria
V. P.-Sales: E. G. Ball
MF, WN, PS, GS, GH, TS

★LYCOMING DIV., AVCO MFG. CORP.
550 S. Main St., Stratford, Conn. (Tel. DRexel 8-0431)
Dir.-Purch.: Frank Larkins
V. P.-Sales Mgr.: H. Webster Crum
MF, WN, PS, GS
★(See advertisement in this issue)

LYNCH CARRIER SYSTEMS INC.
695 Bryant St., San Francisco 7, Calif. (Tel. EXbrook 7-1471)
Purch. Agent: J. E. Gilchrist
Sales Mgr.: E. B. Stone

LYNDON AIRCRAFT, INC.
140 Clifford St., Newark, N. J. (Tel. MI 2-4090)
Purch. Agent: Wm. O'Neill
MF, WN, PS, GS, GH, GE, TS, TR

LYTLE ENGRG. & MFG. CO.
1404 San Mateo, S. E., Albuquerque, N. Mex. (Tel. ALpine 5-1671)
Purch. Agent: Perry Weaver
Div. Mgr.-Sales: L. V. Julihn
MF, WN, PS, GS, GH, GE, CO, TS, TR

MB MFG. CO.
781 Whalley Ave., New Haven 8, Conn. (Tel. FUlton 9-1511)
Mgr.-Purch.: Carl Verderame
Aircraft Sales Mgr.: T. MacDonald
Chief Sales Engr.-Vibration Test Equip.: E. G. Oravec MF, PS, CO, TS, TR

M. C. MFG. CO.
P. O. Box 126, 118 Indianwood Rd., Lake Orion, Mich. (Tel. MYrtle 2-2711)
Buyer: R. Rhodes
Sales: H. P. Ott PS, GS, GH

MF ELECTRONICS CO.
122 E. 25th St., New York 10, N. Y. (Tel. GRamercy 3-5899)
Chief Engr.: Martin J. Finkelstein
GH, GE, CO, TS, TR

MPM, INC.
9110 George Ave., Cleveland 5, O. (Tel. BRoadway 1-4456)
V. P.-Purch.: A. B. Cook
Purch. Agent: F. K. Lawton
Sales Engr.: J. M. Van Walshauser

M & T CO., THE
1212 Chestnut St., Philadelphia, Pa. (Tel. WAlnut 3-0235)
Comptroller: George Soisson
V. P.-Sales: James J. McKeegan

M-W LABS., INC.
1824 N. Milwaukee Ave., Chicago, Ill. (Tel. DIckens 2-4020)
Supt.-Purch.: Harold H. Murray
Sales Mgr.: Mort Berlin MF, WN

MACARR, INC.
2543-45 Boston Rd., New York 67, N. Y. (Tel. OL 3-3306)
Purch. Agent: Phil Brumo GS

MACCHI & CO.
819 Valencia St., San Francisco, Calif. (Tel. VAlencia 6-0175)
Gen. Mgr.: V. L. Kirkendall

MACHINE ENGRG. CO. INC.
5110 E. 15th St., Tulsa, Okla. (Tel. WE 9-6923)
Mgr.: W. A. Miller MF, WN, PS, GE

MACHINERY SALES & ENGRG. CO.
422 Empire Bldg., Pittsburgh 22, Pa. (Tel. ATlantic 1-5586)
Engr.: Carl Anders

MACH TRUCKS, INC., GOV'T. DIV.
1026 17th St., N. W., Washington, D. C. (Tel. RE 7-3993)
Mgr.-Gov't. Div.: Richard H. McMahon

MACKAY RESEARCH LABS.
R.R. 2, Box 401, McHenry, Ill.
Dir.-Purch. & Sales Mgr.: Diane MacKay
Asst. Dir.-Purch.: Sanders MacKay
TR

MACMILLAN CO., THE
60 Fifth Ave., New York 11, N. Y. (Tel. OR 5-4000)
Adv. Mgr.: Robert H. Fetridge PS

MAGLINE INC.
1802 Mercer St., Pinconning, Mich. (Tel. TRiangle 9-2411)
Purch. Agent: R. A. Austin
Sales Mgr.: F. A. Reger
MF, WN, PS, GS

MAGNASYNC MFG. CO., LTD.
5546 Satsuma Ave., N. Hollywood, Calif. (Tel. STanley 7-5493)
Electronics Purch.: George Duerr
Mechanical Purch.: Louis Schirm
Sales Mgr.: Howard V. Auchstetter
MF, PS, GS, GH, GE, CO, TS, TR

MAGNAVOX CO., THE
2131 Bueter Rd., Ft. Wayne, Ind. (Tel. E9721)
Dir.-Material: R. B. Brown
Asst. Dir.-Material: Walter Longbottom
Mgr.-Govt Div.-Sales: David W. Martin
GS, GH, GE, CO, TS, TR

MAGNECRAFT ELECTRIC CO.
3352 N. Grand Ave., Chicago 51, Ill. (Tel. EVerglade 4-6868)
Buyer: R. D. Splitt
Sales: H. D. Steinback GE, TR

MAGNETIC CORE CORP.
John & Lawrence Sts., Newburgh, N. Y. (Tel. NEwburgh 5116)
Purch. Agent: R. G. Burdick
Sales: Robert Webb GS, TR

MAGNETIC DEVICES, INC.
712 East St., Frederick, Md. (Tel. MO 2-2144)
Purch. & Sales Dept.: F. J. Cook GE

MAGNETIC SEAL CORP.
301 Sowams Rd., Barrington, R. I. (Tel. CHerry 5-4800)
Gen. Mgr.: R. J. Pfeiffer
Buyer: E. A. Feeney
Sales: G. E. Cobly MF, PS, GS

MAGNETIC SHIELD DIV.-PERFECTION MICA CO.
1322 N. Elston Ave., Chicago 22, Ill. (Tel. EVerglade 4-2122)
Purch. Agent: Henry Hucksold
MF, WN, PS, GS, GE, CO, TS, TR

MAGNETIC WINDINGS DIV., ESSEX WIRE CORP.
Freemansburg Ave. & Hobson Blvd., Easton, Pa. (Tel. 3-2751)
Purch. Agent: Carl Kichline
Sales: J. A. Ritter

MAGNETICO, INC.
6 Richter Ct., E. Northport, N. Y. (Tel. ANdrew 1-4502)
V. P.: Mark Barry GE, TS, TR

MAGNETROL, INC.
2110 S. Marshall Blvd., Chicago 23, Ill. (Tel. BIshop 7-4000)
Purch. Agent: C. F. Sopinski
Sales Mgr.: Lester E. Stybr PS, GE

MAGNUSON ENGINEERS, INC.
509 Emory St., San Jose 10, Calif. (Tel. CYpress 2-3657)
Purch. Agent: Milton W. Howe
Asst. Purch. Agent: Jack Carter
V. P.-Sales: Traver J. Smith GS

MAGTROL, INC.
240 Seneca St., Buffalo 4, N. Y. (Tel. MOhawk 7451)
V. P.: James F. Duncan
Sales Mgr.: John E. Traise
WN, PS, GS, GE, CO, TS, TR

R. C. MAHON CO., THE
6565 E. Eight Mile Rd., Detroit 34, Mich. (Tel. JEfferson 6-8200)
V. P.-Chg. Purch.: R. J. Kraemer
Purch. Agent: C. D. Tucker
Buyers: J. R. Schindler, M. H. Ettinger, G. Sepke & P. J. Hunter
MF, WN, PS, GS, GH, GE, TS, TR

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

MAICO ELECTRONICS, INC.
21 N. 3rd St., Minneapolis 1, Minn. (Tel. FEdera 9-7041)
V. P.-Purch. & Special Prods. Sales: J. T. Utne
Purch. Agent: John Wheeler
Asst. Purch. Agent: William E. Cunningham
PS, GS, GH, GE, CO, TS, TR

MALCO TOOL & MFG. CO.
4025 W. Lake St., Chicago 24, Ill. (Tel. SAcramento 2-0187)
Purch. Agent: Walter J. Kulins
Sales Mgr.: Anthony Daidone
WN, PS, GS, GE, TS, TR

P. R. MALLORY & CO. INC.
3035 E. Washington St., Indianapolis 6, Ind. (Tel. MElrose 6-5353)
Dir.-Purch.: George C. Mercer
Capacitor Dept. Purch. Agent: C. A. Rieman
Purch. Mgr.-Metallurgical Div.: W. J. Topmiller
V. P.-Marketing: H. C. Buell
MF, WN, PS, GS, GH, GE, CO, TS, TR

★MALLORY-SHARON METALS CORP.
980 Warren Ave., Niles, O. (Tel. OL 2-9951)
Dir.-Purch. & Traffic: B. E. Marquis
Dir.-Sales: R. E. Cunnick MF
★(See advertisement in this issue)

MANGER ELECTRIC CO.
Miller St., Stamford, Conn. (Tel. FIreside 8-7761)
Purch. Agent: D. M. Frankel
Sales Mgr.: B. L. Manger
MF, PS, GS, TR

MANSON LABORATORIES, INC.
P. O. Box 594, 207 Greenwich Ave., Stamford, Conn. (Tel. DAvis 4-6738)
M. Leroy PS, GS, GE, CO, TS, TR

MANTEC INC.
126 Maryland St., El Segundo, Calif. (Tel. EAstgate 2-0659)
Purch. Agent: Melvin C. Berkenbosch
Buyers: K. C. McBride, C. W. Austin & Fred Morhauser
V. P.-Sales: James A. Sneller

MAR VISTA ENGRG. CO.
3411 Tulare Ave., Burbank, Calif. (Tel. VIctoria 9-3251)
Prod. & Purch. Control: Russ Bradford
Gen. Sales Mgr.: Lee Wixsom
PS, GS, GE, CO, TS, TR

MARA ELECTRONICS, INC.
44 Court St., Brooklyn 1, N. Y. (Tel. ULster 5-0488)
Buyer: Mike Voyna
Sales Mgr.: Ernie Allen

MARBLETTE CORP., THE
37-31 30th St., Long Island City 1, N. Y. (Tel. STillwell 4-8100)
Research Dir.: Max Hilrich MF

MARBON CHEMICAL DIV.-BORG-WARNER CORP.
7165 Chicago Ave., Gary, Ind. (Tel. TUrner 6-9146)
Dir.-Purch.: R. M. Stewart
Sales Mgr.: D. M. Pratt MF

MARCHANT MACHINING CORP.
4704 Rhode Island Ave., Hyattsville, Md. (Tel. WA 7-6203)
Secy.-Mgr.: John E. Norris GS

MARCO INDUSTRIES CO.
207 S. Helena St., Anaheim, Calif. (Tel. KEystone 5-6037)
Purch. Agent & Prod. Supt.: F. C. Loehnig
Sales Mgr.: W. W. Bowles
MF, PS, GS, GH, GE, TS, TR

MARCONI INSTRUMENTS
111 Cedar Lane, Englewood, N. J. (Tel. LOwell 7-0607)
Mgr.-Purch.: R. J. Bailey
Sales Mgr.: W. A. Buck

MARION ELECTRICAL INSTRUMENT CO.
Grenier Field, Manchester, N. H. (Tel. NAtional 5-6971)
Purch. Agent: Carl Heath
Buyer: R. Mahoney
V. P.-Sales: E. S. Maury
GS, GE, CO, TS, TR

MARK PRODUCTS CO.
6412 W. Lincoln Ave., Morton Grove, Ill. (Tel. ORchard 5-4999)
E. F. Harris GS, GE, TR

MARKITE CORP.
155 Waverly Pl., New York 14, N. Y. (Tel. OR 5-1384)
Dir.-Proc.: J. Livingston
Purch. Agent: J. Smith
Sales: H. A. Gottschall GE, TS, TR

MARLIN-ROCKWELL CORP.
402 Chandler St., Jamestown, N. Y. (Tel. 61-541)
Dir.-Purch.: C. A. Berg
Purch. Agent: G. J. Paquin
PS, GS, GH, GE

MARMAN DIV., AEROQUIP CORP.
11214 Exposition Blvd., Los Angeles 64, Calif. (Tel. BRadshaw 2-8511)
Purch. Agent: W. E. Flaherty
Buyers: V. P. Estes & Jan Smith
Aircraft Sales Mgr.: T. J. Josalle

MAROTTA VALVE CORP.
Boonton Ave., Boonton, N. J. (Tel. DEerfield 4-2791)
Purch. Agent: Harold Richards PS, GS

MARQUARDT AIRCRAFT CO.
16555 Saticoy St., Van Nuys, Calif. (STate 5-8361)
Mgr.-Materiel: R. G. Francis
Dir.-Cust. Rel.: J. Louis Reynolds
MF, WN, PS, GS, GH, GE, TS

JAS. P. MARSH CORP.
3501 Howard St., Skokie, Ill. (Tel. ORchard 3-4300)
Purch. Agent: P. Keppeler
PS, GS, GE, CO, TS

JOHN MARSHALL ASSOCIATES, INC.
Box 2463, Bridgeport 8, Conn. (Tel. ED 5-9401)
Pres.: M. M. Bassick GE

MARTIN CO., THE
Middle River, Md. (Tel. MUrdock 7-3800)
V. P.-Sales & Service: Jess W. Sweetser

★MARTIN CO., THE
P. O. Box 179, Denver 1, Colo. (Tel. PYramid 4-5211)
H. W. Merrill
★(See advertisement in this issue)

MARVEL ENGRG. CO.
7227 N. Hamlin Ave., Chicago 45, Ill. (Tel. JUniper 8-6023)
R. T. Sochor PS, GS

MARYLAND LAVA CO.
Box MGD-205, Bel Air, Md. (Tel. 1441)
Purch.: John B. Dinning
MF, WN, PS, GE, TR

MASSA LABS., INC.
5 Fottler Rd., Hingham, Mass. (Tel. RIverview 9-4800)
Purch. Agent: Robert R. Thomas
PS, GS, GH, GE, CO, TS, TR

MASONITE CORP.
111 W. Washington St., Chicago 2, Ill. (Tel. FRanklin 2-5644)
Asst. to V. P.: R. K. Lewis

MAST DEVELOPMENT CO., INC.
2212 E. 12th St., Davenport, Iowa (Tel. 3-9729)
Purch. Agent: Vernon W. Fier
Asst. Gen. Mgr.-Sales: Leo E. Hubner
MF, WN, PS, GS, GH, CO, TS, TR

MASTER APPLIANCE MFG. CO.
532-542 Fourth St., Racine, Wis. (Tel. MElrose 3-7791)
Purch. Agent: J. H. Anderson
Sales Mgr.: F. E. Schumacher

MASTER SPECIALTIES CO.
956 E. 108th St., Los Angeles 59, Calif. (Tel. LOrain 4-4481)
Purch. Agent: William Smith
Sales: Art Graver

MASTER TAPE PRINTERS
3400 N. Halsted St., Chicago 13, Ill. (Tel. EAstgate 7-3322)
Gen. Mgr.: Louis Doremeister
Sales: Ruth G. Doremeister
MF, PS, TS, TR

JAS. H. MATTHEWS & CO.
3942 Forbes St., Pittsburgh 13, Pa. (Tel. MUseum 1-8500)
Purch. Agent: G. Gray
Supt.: A. M. Brown
V. P.-Sales: T. J. Miers GS, TR

J. A. MAURER, INC.
37-01 31st St., Long Island City 1, N. Y. (Tel. STillwell 4-4600)
Dir.-Procurement: Leon Shaw
Purch. Agent: Charles Schaffer
Asst. Buyer-Expediters: Daniel Harrington, Harold Mancusi
Products Sales Mgr.: Frank J. Kelly
MF, WN, PS, GS, GH, GE, CO, TS, TR

W. L. MAXSON CORP., THE
475 10th Ave., New York 18, N. Y. (Tel. LOngacre 5-1900)
Purch. Mgr.: E. V. Anderson
Sales Mgr.: W. P. McNally
MF, WN, PS, GS, GH, GE, CO, TS, TR

McDONNELL AIRCRAFT CORP.
Lambert St. Louis Airport, Box 516, St. Louis 3, Mo. (Tel. PErshing 1-2121)
V. P.-Procurement & Quality Control: Lloyd Harrison
Mgr.-Purch.: W. J. Gamewell
Mgr.-Subcontracts: W. P. Becker
V. P.-Customer Service: J. F. Aldridge

McCORMICK SELPH ASSOCIATES
Hollister Airport, Hollister, Calif. (Tel. MEcury 7-3731)
Purch. Agent: Jim McConnell
V. P.-Sales: Frank Lahaye
MF, WN, PS, GS, GH, GE

McCOY ELECTRONICS CO.
Mount Holly Springs, Pa. (Tel. 376)
Purch. Agent: Erwin C. Hess
Sales Mgr.: David B. Jacoby
GS, GE, TS, TR

JULIAN A. McDERMOTT CORP.
1639 Stephen St., Ridgewood, L. I. 27, N. Y. (Tel. GL 6-3606)
J. A. McDermott GS

A. Y. McDONALD MFG. CO.
12th & Pine Sts., Dubuque, Iowa (Tel. 3-7311)
Purch. Agent: M. L. Kanl
Gen. Sales Mgr.: R. E. Sage
MF, GS, GE

McDOWELL CO. INC.
3203 W. 71st St., Cleveland 2, O. (Tel. AT 1-3131)
J. R. Perkins

McGILL MFG. CO. INC.
Valparaiso, Ind. (Tel. 2-6401)
Purch. Agent: George A. Walsh
V. P.-Sales: K. J. Brownell
PS, GS, GE

McKENNA LABS.
2503 Main St., Santa Monica, Calif. (Tel. EXbrook 9-8846)
Pres.: A. G. McKenna
GS, GE, TS, TR

McLEAN ENGRG. LABORATORIES
P. O. Box 228, 70 Washington Rd., Princeton, N. J. (Tel. WAlnut 4-4440)
Purch.: A. Donald Hay
Sales: W. B. Eckenhoff
PS, TR

McMILLAN INDUSTRIAL CORP.
Brownville Ave., Ipswich, Mass. (Tel. 0387)
V. P.-Purch.: N. N. Janus
Purch. Agent: Brian Abbott
V. P.-Sales: Arthur Brink
MF, WN, PS, GE, TS, TR

MECHANICAL AIR CONTROLS, INC.
10030 Capital Ave., Detroit 37, Mich. (Tel. JOrdan 4-6858)
Purch. Agent: Larry Newton
Sales Mgr.: N. B. Archer

MECHANICAL DIV.-GENERAL MILLS, INC.
1620 Central Ave., Minneapolis 13, Minn. (Tel. STerling 9-8811)
Mgr.-Purch.: A. E. Wickman
Dir.-Sales: E. F. Coy
MF, WN, PS, GS, GE, CO, TS, TR

MECHANICAL PRODUCTS INC.
1824 River St., Jackson, Mich. (Tel. STate 2-0391)
Head-Purch. Dept.: C. C. Frost
Sales Engr.: P. R. Watson

MECHANICS RESEARCH DEPT., AMERICAN MACHINE & FOUNDRY CO.
2510 S. Wabash Ave., Chicago 5, Ill. (Tel. WEbster 9-5385)
Dir.: P. Rosenberg

MELETRON CORP.
950 N. Highland Ave., Los Angeles 38, Calif. (Tel. HOllywood 3-4841)
Purch. Suprvsr.: J. J. Lamb
Sales Mgr.: Robert G. Breyer
GE

MELODY MASTER MFG. CO.
2842 N. Cicero Ave., Chicago 41, Ill. (Tel. KIldare 5-5559)
Pres.: J. M. Trittenbach
TR

MENASCO MFG. CO.
805 S. San Fernando Blvd., Burbank, Calif. (Tel. VIctoria 9-3261)
Dir.-Materiel Div.: Thomas E. Merrick
Purch. Agent: William Caprine
Prod. Planning (Tex. Div.): William R. Browne, Box 7397 Sylvania Sta., Ft. Worth, Tex. (Tel. ATlas 4-3471)
Purch. Dept. (Tex. Div.): John Scruggs, Ft. Worth
V. P.-Sales: Jack I. Hamilton, Ft. Worth
MF, WN, PS, GS, GE, TS, TR

J. E. MENAUGH CO.
4555 N. Broadway, Chicago 40, Ill. (Tel. UPtown 8-2343)
Purch.: M. M. Maher
MF, WN, PS, GH, TR

MENDELSOHN SPEEDGUN CO. INC.
4th Ave., Haskell, N. J. (Tel. TErhune 5-3224)
Mgr.: Harold Gaffin
MF, PS, GS, GE, TR

MENLO RESEARCH LAB.
538 Phelan Ave., San Jose, Calif. (Tel. CYpress 7-0455)
Dir.-Purch.: Charles Weeks
MF, GS, GE, CO, TS, TR

MEPCO INC.
37 Abbett Ave., Morristown, N. J. (Tel. JEfferson 9-2000)
GE

MERCAST MFG. CORP.
2620 1st St., La Verne, Calif. (Tel. LYcoming 3-4521)
Purch. Agent: P. L. Cunningham
Sales Coordinator: Dale Richins
MF, PS

MERCURY AIR PARTS CO., INC.
3826 Willat Ave., Culver City, Calif. (Tel. TE 0-5923)
Purch. Agent: I. A. Cole
Sales Mgr.: Ralph Cohen
MF, WN, PS, TR

MERCURY CONTACTS, INC.
Box 615, Far Hills Sta., Dayton 19, O. (Tel. ULrick 9-4201)
Pres.: A. F. Munhall
GE, TR

MERCURY ELECTRONIC CO.
Box 450-C, Red Bank, N. J. (Tel. AT 1-2700)
Dir.-Purch.: T. George
Sales: A. Munchak, Jr.

MERCURY INTERNATIONAL INDUSTRIES INC.
253 N. Fair Oaks, Pasadena, Calif. (Tel. RYan 1-5161)
Suprvsr.-Purch.: L. E. Staal
V. P.-Purch.: R. R. Miller
Project Machinist: R. Stebenne
Sales Engr.: D. A. Kellar

MERCURY RAD CORP.
15-35 129th St., College Point 56, N. Y. (Tel. HIckory 5-4449)
Purch. Agent: Walter Mack
V. P.-Gen. Sales Mgr.: Anthony Drabicki

MERIDIAN METALCRAFT, INC.
8739 S. Millergrove Dr., Whittier, Calif. (Tel. OXford 2-3761)
Purch. Agent: D. W. Willis
Sales Mgr.: C. M. Peterson
MF, GS, GE, CO, TS, TR

MERIX CHEMICAL CO.
1021 E. 55th St., Chicago 15, Ill. (Tel. HYdepark 3-7855)
Gen. Mgr.-Purch.: Eric O. Sonneman
Sales Mgr.: E. Arshack
MF, WN, PS, GS, GH, GE, TS, TR

MERZ ENGRG., INC.
200 S. Harding St., Indianapolis, Ind. (Tel. ME 2-7431)
Purch. Agent: Murray Davidson
Buyer: Carl Pfeifer
Sales Mgr.: Chas. V. Retherford
MF, PS, GS

MESA PLASTICS CO.
11751 Mississippi, Los Angeles 25, Calif. (Tel. BR 2-0250)
Plant Mgr.: K. G. Wolverton
V. P.: F. C. Karas
MF, PS, GE, TR

METAL CARBIDES CORP.
6001 Southern Blvd., Youngstown, O. (Tel. STerling 8-6541)
Purch. Agent: H. L. Sprinkel
Sales Mgr.: J. R. Workman
MF

METAL FORMING CORP.
1937 Sterling Ave., Elkhart, Ind. (Tel. 3-3760)
Purch. Agent: C. H. Schmalzried
Gen. Sales Mgr.: C. W. Kelly
MF, WN, PS, GS

METAL MASTERS, INC.
State Rd. 552, Lafayette, Ind. (Tel. 2-0158)
Purch. Agent: Albert J. Marks
MF, WN, PS, GS

METALLO GASKET CO.
16 Bethany St., New Brunswick, N. J. (Tel. KIlmer 5-7223)
Secy.: G. K. Mordas
MF, PS

METALLURGICAL PRODUCTS DEPT., GENERAL ELECTRIC CO.
11177 E. Eight Mile Rd., Detroit 32, Mich. (Tel. JE 6-9100)
MF, WN, PS, GS, GE, TS, TR

METALS & CONTROLS CORP.
55 Forest St., Attleboro, Mass. (Tel. 1-2800)
Dir.-Purch.: E. B. Carpenter
Asst. Dir.-Purch.: Rocca Fantaccione
Buyers: William Gorman & Ralph Berry
V. P.-Sales: John Wilson
MF, WN, PS, GS, GH, GE, CO, TS, TR

METAVAC, INC.
45-68 162nd St., Flushing 58, N. Y. (Tel. FLushing 9-8838)
Purch. Agent: R. Finnegan
Gen. Mgr.-Sales: G. H. Fadel
GE, CO, TS, TR

METERS INC.
5353 N. Keystone Ave., Indianapolis 20, Ind. (Tel. CLifford 5-3570)
Purch. & Sales: F. R. Finehout
GE, CO, TS, TR

METHODE MFG. CORP.
7447 W. Wilson Ave., Chicago 47, Ill. (Tel. UNderhill 7-9600)
Purch.: J. B. Douglas
GH, GE, TS, TR

MET-L-WOOD CORP.
6755 W. 65th St., Chicago 38, Ill. (Tel. LUdlow 5-7575)
Purch. Agent: Edward C. Yore
Sales Mgr.: Dwight O. Williamson

R. I. METPRO, INC.
230 Toronto Ave., Providence 5, R. I. (Tel. STuart 1-3050)
Pres.: James C. Murphy
MF, PS, TS, TR

METRON INSTRUMENT CO.
432 Lincoln St., Denver 3, Colo. (Tel. PEarl 3-3764)
Purch. Agent: H. N. Carothers
Sales Mgr.: Dick Porter
GS, TS

METRONIX, INC., SUB.-ASSEMBLY PRODUCTS, INC.
75 Wilson Mills Rd., Chesterland, Ohio (Tel. HAmilton 3-4440)
Purch. Agent: N. V. Fay
Sales Mgr.: Benjamin R. Kamens
GS, GE, CO, TS, TR

MEYERCORD CORP.
5323 W. Lake St., Chicago 44, Ill. (Tel. ESterbrook 8-3700)
Adv. & Sales Prom. Mgr.: Ralph Royer

MEYERCORD CO., THE, AMC DIV.
2915 S. Vail Ave., Los Angeles, Calif. (Tel. RAymond 3-8661)
Purch.: Robert Bell
Div. Mgr.-Sales: John A. Cargill
MF

MICA CORP.
4031 Elenda, Culver City, Calif. (Tel. VE 9-5283)
Purch.: Ed Kazarian
Dir.-Mktg.: Milton B. Grossman
MF, GE, TS, TR

MICA FABRICATING CO.
53 Central Ave., Rochelle Park, N. J. (Tel. HUbbard 7-5717)
Purch.: M. H. Cymberg
Sales: J. W. Canter
MF, WN, PS, GE, TR

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

MICACRAFT PRODUCTS INC.
701 McCarter Hwy., Newark, N. J. (Tel. MArket 3-6921)
Purch. Agent: N. A. Pomar
Sales: C. E. Garneau, Jr. PS, TR

MICHIGAN WIRE CLOTH CO.
2100 Howard, Detroit 16, Mich. (Tel. TAshmoo 6-6500)
Purch. Agent: George H. Leekey
V. P.-Sales: W. H. Blodgett PS, GS

MICRO BALANCING, INC.
191 Herricks Rd., Garden City Park, L. I., N. Y. (Tel. Pioneer 6-0851)
Purch: C. A. Pernice
Sales: D. A. Francis

MICRO GEE PRODUCTS, INC.
6319 W. Slauson, Culver City, Calif. (Tel. EXmont 1 1716)
Chief Engr.: B. W. McFadden

MICRO SWITCH, DIV.-MINNEAPOLIS-HONEYWELL REG. CO.
11 W. Spring St., Freeport, Ill. (Tel. STate 4400)
Purch. Agent: W. A. Young
Asst. Purch. Agent: R. Waggoner
Buyers: B. Swartz, K. Lowe, A. Joesten
Sales: F. E. Wilsey GE, TS, TR

MICROLAB
71 Okner Pkwy., Livingston, N. J. (Tel. 6-0692)
Purch.: Joel Feldstein
Sales: Harry A. Augenblick GE, TR

MICRON GEAR MFG. CO.
73 Rushmore St., Westbury, L. I., N. Y. (Tel. EDgewood 4-8880)
Purch. Agent: Bill Benjamin
Mgr.-Sales: Milo Amorosia

MICROSONICS, INC.
Hingham Ind. Ctr., 349 Lincoln St., Rt. 3A, Hingham, Mass. (Tel. 6-3100)
V. P.: Francis E. Baker, Jr.
Admin. Asst.-Purch.: Robert J. Gigger

MICROTRAN CO. INC.
145 E. Mineola Ave., Valley Stream, N. Y. (Tel. LO 1-6052)
Purch. Agent: Albert Eisenberg
V. P.-Sales: A. Joel Eisenberg
GS, TS, TR

MICROWAVE DEVELOPMENT LABS., INC.
92 Broad St., Babson Park 57, Mass. (Tel. CEdar 5-6252)
Purch. Agent: William H. Davis, Jr.
Buyer: William McKenna
Gen. Mgr.-Sales: Nathaniel Tucker
GE, TR

MICROWAVE ELECTRONICS DIV., SPERRY GYROSCOPE CO.
Great Neck, N. Y. (Tel. Fieldstone 7-3600)
Purch. Agent: G. C. Hees
Sales Mgr.: George W. Lober

MICRO-WIRE TUNGSTEN & MOLYBDENUM PRODUCTS
301 Crooks Ave., Clifton, N. J. (Tel. PRescott 9-0819)
Stephen H. Meninger
MF, WN, PS, GS, GH, GE

MID-CENTURY INSTRUMATIC CORP.
611 Broadway, New York, N. Y. (Tel. SPring 7-4016)
Purch. Agent: Charles Sobel
Sales Engrg. Mgr.: Charles B. Husick

MIDLAND MFG. CO., INC.
3155 Fiberglas Rd., Kansas City, Kans. (Tel. FInley 2-7950)
Purch. Agent: H. F. Ellis
V. P.-Sales: H. G. Humann
GS, GE, TR

MIDLAND PAINT & VARNISH CO., THE
3801 E. 91st St., Cleveland 5, O. (Tel. BR 1-4050)
Purch. Agent: Frank S. Glucek
MF, PS, GE, TR

MIDGET LOUVER CO.
6-8 Wall St., Norwalk, Conn. (Tel. VOlunteer 6-2342)
Purch.: Miller Mfg. Co., Barnum Ave., Stratford, Conn.
Pres.: Frank J. Scallon

MID-WEST SPRING MFG. CO.
4632-40 S. Western Ave., Chicago 9, Ill. (Tel. LAfayette 3-1743)
Purch. Agent-Chicago Plant: James J. Dunne, Jr.
Purch. Agent-St. Paul Plant: Cliff Reger (Tel. HU 8-2521)
Purch. Agent-Mentone, Ind., Plant: Richard E. Middleton (Tel. EL 3-2415)
Sales: L. J. Castaldi MF, PS

MILES REPRODUCER CO. INC.
812 Broadway, New York 3, N. Y. (Tel. SPring 7-7670)
Purch.: J. M. Kuhlik
Sales: H. B. Kuhlik TR

MILJAN DIV., PAUL OMOHUNDRO CO.
P. O. Box 396, 15506 Vermont St., Paramount, Calif. (Tel. MEtcalf 3-1023)
Purch. Agent: Robert Cowdin
Mgr.-Electronics Div.-Sales: Charles E. Roberts

AUGUST E. MILLER LABS.
9226-9228 Hudson Blvd., North Bergen, N. J. (Tel. UNion 9-2142)
Purch. Agent: Mrs. Dorothy Meyer
Chief Engr.: August E. Miller
Plant Mgr.-Purch.: Charles F. Hummer
Chief Mechanic-Purch.: Charles J. Schmidt
MF, WN, GS, GE, CO, TS, TR

FRANKLIN P. MILLER & SON, INC.
36 Meadow St., East Orange, N. J. (Tel ORange 3-4522)
Purch. Agent: H. Preyer
Sales: H. Galanty

J. W. MILLER CO.
5917 S. Main St., Los Angeles 3, Calif. (Tel. ADams 3-4294)
Purch.: L. G. Crawford, Jr.
Sales: J. R. Hummes

SANFORD MILLER CO.
691 Bedford Ave., Brooklyn 6, N. Y. (Tel. ULster 8-2817)

MILLER ELECTRO-RESEARCH LABS.
5529 S. 5th St., Milwaukee 7, Wisc. (Tel. HUmboldt 3-6303)
A. W. Miller GE

MILLER-ROBINSON CO.
7007 Avalon Blvd., Los Angeles 3, Calif. (Tel. PLeasant 2-6141)
Gen. Mgr.: J. B. Leavell
Asst. Sales Mgr.: Myron B. Adler
GH, GE

MILMAN ENGRG. CO.
1831 Pontius Ave., Los Angeles 25, Calif. (Tel. GR 3-0616)
Mgr.: Herman F. Spowal
MF, WN, PS, GS, GH, GE, CO, TS, TR

MILMANCO
Wood Bldg., 3rd & Main Sts., Renton, Wash. (Tel. ALpine 5-8656)
Co-Mgr., Purch. & Sales: Philip B. Lundstrom
Co-Mgr., Purch.: Thomas H. Cooke
Supt.: Robert W. Burman

MILO ELECTRONICS CORP.
530 Canal St., New York 13, N. Y. (Tel. BEekman 3-2980)
Purch. Agent: Louis Koch
Buyer: Howard Norris
Sales Mgr.: Robert A. Smith

MILRO CONTROLS CO.
Hawthorne Ave., Park Ridge, N. J. (Tel. PArk Ridge 6-2595)
Purch.: Milton Rosen
Sales Mgr.: E. D. Burdi

MINATRON CORP.
61 Cliveden St., Belle Mead, N. J. (Tel. FLanders 9-6400)
Gen. Mgr.: C. W. Pressey TS, TR

MINCO PRODUCTS, INC.
740 Washington Ave., N., Minneapolis 1, Minn. (Tel. FEderal 8-6753)
Purch. Agent: Robert B. Anderson
V. P.-Sales: Karl Schurr
GS, GE, CO, TS, TR

MINCOM DIV., MINNESOTA MINING & MFG. CO.
2049 S. Barrington Ave., Los Angeles, Calif. (Tel. GRanite 9-3751)
Purch. Agent: J. J. Huff
Sales Mgr.: Robert J. Brown TS, TR

MINE SAFETY APPLIANCES CO.
201 N. Braddock Ave., Pittsburgh 8, Pa. (Tel. CH 1-5900)
Purch. Agent (Safety Prod.): J. P. Curran
Purch. Agent (Tech. Prod.): F. J. Guenther
Sales Mgr. (Safety Prod.): F. A. King
Sales Mgr. (Tech. Prod.): N. W. Hartz
PS, GS, GH, CO, TS

MINIATURE PRECISION BEARINGS, INC.
Precision Pk., Keene, N. H. (Tel. ELmwood 2-0310)
Purch.: Leo E. Vogel, Harold Mizo, R. Whitney
Gen. Marketing Mgr.: R. I. Kern
PS, GH, GE

MINITRONICS CORP.
328 Grand St., New York 2, N. Y. (Tel. OR 4-8250)
V. P.-Prod., Sales: Matthew Katz
GE, TS, TR

MINNEAPOLIS-HONEYWELL REGULATOR CO., AERONAUTICAL DIV.
2600 Ridgway Rd., Minneapolis 13, Minn. (Tel. STerling 1-8011)
Dir.-Proc.: Richard B. Foster
Purch. Agent-Raw Materials: O. S. Williamson
Purch. Agent-Prod. Parts & MRO: D. A. Sprague
Purch. Agent-Engrg. & Device Sub.: R. F. Marcy
Purch. Agent-Travelling: E. L. Johnson
Mgr.-Sales: C. L. Davis TS, TR

MINNEAPOLIS-HONEYWELL REGULATOR CO., BOSTON DIV.
1400 Soldiers Field Rd., Boston 35, Mass. (Tel. ALgonquin 4-5200)
Purch. Agent: E. L. Hanscom
Sales Mgr.: J. E. Egbert

MINNEAPOLIS-HONEYWELL REGULATOR CO.-DAVIES LABS. DIV.
10721 Hanna St., Beltsville, Md. (Tel. WEbster 5-2700)
Purch. Agent: John Paszkiet
Sales Mgr.: N. S. Bassett GH, GE, TS

MINNEAPOLIS-HONEYWELL REGULATOR CO., INDUST. DIV.
Wayne & Windrim Ave., Philadelphia, Pa. (Tel. DAvenport 9-8300)
Purch. Agent: J. H. Taws
Sales Mgr.: J. A. Robinson
MF, PS, GS, GH, GE, CO, TS, TR

MINNEAPOLIS-HONEYWELL REGULATOR CO., ORDNANCE DIV.
600 2nd St., N., Hopkins, Minn. (Tel. WEstport 8-3571)
Mgr.-Proc.: J. F. Barrett
Purch. Agent: Ove Olson
Purch. Agent: Clifford Swisher, Minneapolis-

Honeywell Ordnance Missile Engrg. Ctr., Duarte, Calif. (Tel. ELliott 9-5311)
Dir.-Serv. Engrg.: William D. Owens

MINNEAPOLIS-HONEYWELL REGULATOR CO., SEMICONDUCTOR PRODUCTS DIV.
2753 4th Ave., S., Minneapolis, Minn. (Tel. FEderal 2-5225)
Mgr.-Purch.: M. E. Knutson
Asst. Purch. Agent-Raw Materials: Wilbur Smisek
Sales Mgr.: R. O. Anderson

MINNESOTA AUTOMOTIVE, INC.
1101 N. Front St., Mankato, Minn. (Tel. 4593)
Purch. Agent: I. B. Chandler
Sales: G. J. McGrath GH

MINNESOTA MINING & MFG. CO.
900 Bush Ave., St. Paul 6, Minn. (Tel. PRospect 6-8511)
Sales Mgr.: Dan Denham

MIRACLE SIGN CO.
734 S. Washington, Wichita, Kans. (Tel. HO 4-8593)
Purch. & Sales: C. Drue Jackson

MISCO PRECISION CASTING CO.
116 W. Gibbs St., White Hall, Mich. (Tel. 2-1515)
Purch. Agent: Howard Bartholomew
Purch. Agent-Muskegon, Mich.: M. Simms (Tel. 6-3541)
V. P.-Sales: K. Yonker MF, PS

MISKELLA INFRA-RED CO., THE
E. 73rd & Grand Ave., Cleveland 4, O. (Tel. HEnderson 1-2210)
Purch. Agent: F. Zitek PS, GS

★MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
4218 W. Lake St., Chicago 24, Ill. (Tel. VAn Buren 6-3100);
16618 Ventura Blvd., Encino, Calif. (Tel. STate 9-8115)
Purch. Agent: Edward Hall
Tech. Serv. Engr.: Kacil Brin
WN, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

MISSILE DEVELOPMENT DIV., NORTH AMERICAN AVIATION, INC.
12214 Lakewood Blvd., Downey, Calif. (Tel. LUdlow 2-8651)
Dir.-Material: Mark Starr
Purch. Agent: N. C. Dopheide

MISSILE ENGRG. PRODUCTS, INC.
9th & Guava, Eau Gallie, Fla. (Tel. 4622)
V. P.-Purch.: Jack K. Van Hook
Prod. Mgr.: Don Lathrup
PS, GS, GH, GE, TS, TR

MISSIMERS INC.
3206 Los Feliz Blvd., Los Angeles 39, Calif. (Tel. NOrmandy 5-4261)
V. P.-Purch.: Dale J. Missimer
Engr.-Buyers: H. C. Faris & S. E. Askew
Parts Buyer: C. Lanphear

E. C. MITCHELL CO.
Boston St., Middleton, Mass. (Tel. SPring 4-1191)

MODEL RECTIFIER CORP.
1065 Utica Ave., Brooklyn 4, N. Y. (Tel. HYacinth 5-4600)
Purch. Agent: Anthony Iati
Sales Mgr.: Samuel Gelber GS, TR

MODELECTRIC PRODUCTS CORP.
1500 Bangs Ave., Asbury Park, N. J. (Tel. PR 4-2519)
Purch.: Chas. S. Nadler PS, GS, GE

MODGLIN CO. INC.
3235 San Fernando Rd., Los Angeles 65, Calif. (Tel. CLinton 6-2213)
Purch. Agent: H. E. Fox
MF, WN, GS, GH

MOHAWK WIRE & CABLE CORP.
320 River St., Fitchburg, Mass. (Tel. 3-3569)
Office Mgr.-Purch.: R. L. Peabody
Sales Mgr.: J. W. Resseguie
PS, GS, GH, CO, TS, TR

MOISTURE REGISTER CO.
1510 W. Chestnut St., Alhambra, Calif. (Tel. CUmberland 3-3143)
Purch. Agent: R. I. McLean
Gen. Mgr.: John R. Barnes
GS, GE, CO, TS

MOLDING CORP. OF AMERICA
40 Church St., Pawtucket, R. I. (Tel. PAwtucket 6-2100)
Purch. Agent: Sturgis Green
Sales Mgr.: Stephen Kalarian GS, GE, TR

MONA INDUSTRIES, INC.
P. O. Box 1786, Paterson 17, N. J. (Tel. ARmory 4-8220)
Dir.-Purch.: W. O. Schlimbach
Purch. Agent: N. F. Sivolella
V. P.-Sales: R. H. Sommer MF, GS

MONADNOCK MILLS, SUB.-UNITED-CARR FASTENER CORP.
1977 1st Ave., San Leandro, Calif. (Tel. ELgin 7-3700)
Purch. Agent: George McCloughlin
Sales Mgr.: George Gianandrea
MF, WN, PS, GS, GH, TS, TR

J. J. MONAGHAN CO., INC.
500 Alcott St., Denver 4, Colo. (Tel. AC 2-3558)
Purch. Agent: Moses Taylor
V. P.-Prod. & Engrg.: J. R. Cherry

MONARCH AIRCRAFT SALES, INC.
3311 E. Gage Ave., Huntington Park, Calif. (Tel. LUdlow 2-6431)
Gen. Mgr.: J. H. McKnight
PS, GS, GH, GE, TS

MONITOR PRODUCTS CO.
815 Fremont, S. Pasadena, Calif. (Tel. RY 1-1174)
Buyer: Herbert E. Blasier
Sales Mgr.: John W. Blasier GS, GE

MONODE INC.
3751 Prospect Ave., Cleveland 15, Ohio (Tel. ENdicott 1-3872)
V. P.: Ralph Lindsay
Sales Mgr.: Gordon K. Lanese

MONSANTO CHEMICAL CO.
Lindbergh & Olive St. Rd., St. Louis 24, Mo. (Tel. WYdown 3-1000) PS

MOODY MACHINE PRODUCTS CO., INC.
42-46 Dudley St., Providence 5, R. I. (Tel. GAspee 1-3317)
Sales Mgr.: J. H. Moody
MF, WN, PS, GS, GE

JOHN B. MOORE CORP.
P. O. Box 3, Nutley 10, N. J. (Tel. NUtley 2-6666)
V. P.-Purch.: John A. Campbell
MF, PS, GS, GH, TS

MORAN INSTRUMENT CORP.
170 E. Orange Grove Ave., Pasadena, Calif. (Tel. SY 6-7158)
Prod. Foreman: A. W. Junkunc
V. P.-Sales: H. E. Ohanian

MORGANITE, INC.
33-02 48th Ave., Long Island City 1, N. Y. (Tel. STillwell 4-3222)
Gen. Sales Mgr.: A. W. Edward
MF, WN, PS, GS, GE, TR

J. I. MORRIS CO.
378 Elm St., Southbridge, Mass. (Tel. POrter 4-4394)
Asst. Mgr.: J. B. Dirlam MF, WN, PS

FRANK W. MORSE CO.
1300 Soldiers Field Rd., Boston 35, Mass. (Tel. STadium 2-6626)
Sales Mgr.: Richard W. Morse
GH, GE, CO, TS, TR

CHESTER MORTON ELECTRONICS CORP.
10th St. & Morton Ave., Chester, Pa. (Tel. CHester 3-8584)
Purch. Agent: S. Caine
Sales Mgr.: D. Caine
MF, WN, PS, GE, TR

F. L. MOSELEY CO.
409 N. Fair Oaks Ave., Pasadena, Calif. (Tel. RYan 1-0208)
Purch. Agent: Robert Taylor
Sales: F. L. Moseley

MOSER JEWEL CO.
544 Fayette St., Perth Amboy, N. J. (Tel. HIllcrest 2-3434)
V. P.-Sales: C. H. Kalquist

★MOTOR GENERATOR CORP.
Jackson at Water Sts., Troy, O. (Tel. FE 2-1227)
Dir.-Purch.: B. A. Lutz
Buyers: Robert Miller & L. D. Isenbarger
V. P.-Sales: D. W. Baker
PS, GS, GH, GE, TR
★(See advertisement in this issue)

MOTORDYNE INC.
2661 S. Myrtle Ave., Monrovia, Calif. (Tel. RYan 1-6132)
Purch. Agent: O. Hartle
V. P.-Sales: Fred L. Bezold
PS, GS, GH, GE, TS, TR

MOTORESEARCH CO.
1600 Junction Ave., Racine, Wisc. (Tel. MElrose 2-5131)
Purch. Agent: L. J. Novak
Sales Mgr.: J. G. Hiatt
PS, GS, GH, GE, TR

MOTOROLA INC., MILITARY MARKETING DIV.
8201 E. McDowell, Phoenix, Ariz. (Tel. WH 5-4311)
Purch. Agent: Paul Stancik
Asst. Purch. Agent: Paul Leinheiser

MOTOROLA SEMICONDUCTOR PRODUCTS DIV.
5005 E. McDowell Rd., Phoenix, Ariz. (Tel. BRidge 5-4411)
Mgr.-Purch.: R. S. Nelson
Buyer: A. Porstman
Gen. Mgr.-Sales: J. T. Hickey
GE, TS, TR

MUCKLE MFG. CO.
Box 119, Owatonna, Minn. (Tel. 7249)
Purch. Agent: Robert Doyle

MUCON CORP.
9 St. Francis St., Newark 5, N. J. (Tel. MI 2-1476)
Purch. Agent: B. Berkman
Sales Mgr.: M. A. Prince GE

MUELLER ELECTRIC CO.
1583 E. 31st St., Cleveland 14, O. (Tel. PRospect 1-5225)
Purch. Agent: E. H. deConingh
Sales: Scott Mueller
GS, GE, CO, TS, TR

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

MUNSTON MFG. & SERVICE, INC.
Beech St., Islip, N. Y. (Tel. JUniper 1-3900)
Purch. Agent: Lou Risman
Sales Mgr.: Theodore Whildin

MULTI-AMP CORP.
465 Lehigh Ave., Union, N. J. (Tel. MUrdock 8-7112)
Purch.: B. Bernstein
Sales Mgr.: Robert S. Beckham

CHARLES MUNDT & SONS
53 Fairmount Ave., Jersey City 4, N. J. (Tel. DElaware 3-6200)
Purch. Buyer & Gen. Mgr.: Richard D. Powers
MF

MURPHY & MILLER INC.
610 W. Taylor St., Chicago 7, Ill. (Tel. HArrison 7-8900)
Chief Engr.-Purch.: Paul H. Brandt
Buyer: John Petruska
Sales Mgr.-Environmental Prods. Div.: Nick E. Miller

MUTRON CORP.
125 Perkins Ave., Brockton, Mass. (Tel. JUniper 3-0033)
Purch. Agent: Richard F. Anderson
GS, GH, GE, CO, TR

MYCALEX CORP. OF AMERICA
125 Clifton Blvd., Clifton, N. J. (Tel. PRescott 9-8866)
Purch.: H. C. Westervelt
Sales: J. H. DuBois
MF, WN, PS, GH, GE, CO, TS, TR

MYKROY, INC.
Wheeling & Hintz Rds., Wheeling, Ill. (Tel. 280)
Purch.: W. E. Simpson
MF

NJE CORP.
345 Carnegie Ave., Kenilworth, N. J. (Tel. CHestnut 1-1500)
Purch. Agent: Robert Schrage
Engrg. Sales Mgr.: Robert T. Sigmann
GS, GE, TR

NRC EQUIPMENT CORP.
160 Charlemont St., Newton 61, Mass. (Tel. DEcatur 2-5800)
Purch. Agent: Loring Raymond
Asst. Purch. Agent: Norman Resnich
Sales Mgr.: Harry D. Stom
PS, GS, GH, GE, CO, TS, TR

NYT ELECTRONICS, INC.
2979 N. Ontario St., Burbank, Calif. (Tel. VIctoria 9-2414)
Purch. Agent: G. Graham
V. P.-Sales: R. L. Hyder
GS, GE, CO, TS, TR

GEORGE L. NANKERVIS CO.
15300 Fullerton, Detroit 27, Mich. (Tel. VErmont 8-5780)
Purch. Agent: R. I. Pieti
V. P.-Sales: H. W. Grikscheit
MF, PS, GS, GH, CO, TS, TR

NAPOLEON PRODUCTS CO., THE
410 Filmore St., Napoleon, O. (Tel. 5361)
Gen. Mgr.: G. M. Small
Exec. V. P.-Purch.: E. N. Yeager
MF, PS

NARDA MICROWAVE CORP., THE
118-160 Herricks Rd., Mineola, N. Y. (Tel. Pioneer 6-4650)
Purch. Agent: James Orehosky
V. P.-Sales: William A. Bourke
PS, GH, GE, CO, TS, TR

NARDA ULTRASONICS CORP., THE
118-160 Herricks Rd., Mineola, L. I., N. Y. (Tel. Pioneer 6-4650)
Purch. Agent: Robert Keller
V. P.-Sales Mgr.: Paul M. Platzman
PS, GS, GH, GE, CO, TS, TR

NARMCO MFG. CO.
5159 Baltimore Dr., La Mesa, Calif. (Tel. HOpkins 9-0171)
Purch. Agent: R. G. Simoneau
Dir.-Sales & Engrg.: D. H. Black
MF, WN, RS, GE

NARMCO RESINS & COATINGS CO.
600 Victoria St., Costa Mesa, Calif. (Tel. LIberty 8-1144)
Purch. Agent: Mrs. Maxine Hutchins
Buyer: Marion Edkins
Gen. Sales Mgr.: Wm. D. Rainey
MF, GS, GE, TR

NASH ENGRG. CO., THE
Wilson Ave., S. Norwalk, Conn. (Tel. VOlunteer 6-3351)
Purch. Agent: Harry E. Bradbury
PS, GS, GH

NATIONAL AIROIL BURNER CO.
1345 E. Sedgley Ave., Philadelphia 34, Pa. (Tel. PIoneer 3-5300)
Purch. Agent: Edward P. Bailey, Jr.
V. P.-Sales: Walter A. Horko

NATIONAL CASEIN CO.
601 W. 80th St., Chicago 20, Ill. (Tel. VI 6-7300)
Purch. Agent: Richard S. Cook
Sales Mgr.: Bart Thielges
MF

NATIONAL CERAMIC CO.
500 Southard St., Trenton, N. J. (Tel. EXport 4-5373)
MF, WN, PS, GE

NATIONAL COIL CO.
P. O. Box 1237, Sheridan, Wyo. (Tel. OR 4-7465)
Purch.: Harold Demple
Sales: Joe Demple
MF, GS, GH, GE, TS, TR

NATIONAL COPPER & SMELTING CO.
1862 E. 123rd St., Cleveland 6, O. (Tel. CE 1-2366)
Purch.: C. L. Smith, Jr.
Sales: H. B. Smith
MF, PS

NATIONAL ELECTRIC PRODUCTS CORP.
Two Gateway Center, Pittsburgh 22, Pa. (Tel. GRant 1-2852)
Purch. Agent: George L. Davis
Dir.-Mktg.: Luther D. Shank
MF, PS, GS, GH

NATIONAL ELECTRONICS LABORATORIES, INC.
1713 Kalorama Rd., N. W., Washington 9, D. C. (Tel. HUdson 3-5000)
Production Mgr.: Jack Nagle
Sales Mgr.: Charles A. Wall
GE, TS, TR

NATIONAL ENGRG. PRODUCTS, INC.
435 Washington Bldg., Washington 5, D. C. (Tel. REpublic 7-4473)
V. P.-Purch.: Clinton Rector
MF, WN, GS

NATIONAL FOAM SYSTEM, INC.
Union & Adams Sts., West Chester, Pa. (Tel. OW 6-3600)
Purch. Agent: A. D. Holmes
V. P.: L. W. Boerner

NATIONAL FORGE & ORDNANCE CO.
Irvine, Warren County, Pa. (Tel. YOungsville 2-2301)
Purch. Agent: Willis Cooney
Dir.-Sales: J. H. Kannen
MF, PS

NATIONAL LOCK CO.
1902 Seventh St., Rockford, Ill. (Tel. 2-4455)
V. P.-Gen. Sales Mgr.: A. H. Charles
MF, WN, PS, GS

NATIONAL METAL EDGE BOX CO.
Gloucester Pike, Barrington, N. J. (Tel. LIncoln 7-9000)
V. P.-Sales: E. F. Collins
GH

NATIONAL PNEUMATIC CO., INC.
125 Amory St., Boston, Mass. (Tel. JAmaica 4-7000)
Dir.-Purch.: Sidney Coven
Gen. Sales Mgr.: J. J. Anderson
PS, GE, TS

NATIONAL RESEARCH CORP.
70 Memorial Dr., Cambridge, Mass. (Tel. ELiot 4-5400)
Dir.-Purch.: James R. Caudill
Buyers: Gertrude E. Ryan & Bea M. Matheson
MF, PS, GS, TS

NATIONAL SPECIALTIES CO., INC.
1902 Howell St., Ft. Wayne 7, Ind. (Tel. ANthony 2341)
Asst. Gen. Mgr.: Edward C. Doell
GS

NATIONAL SPECTROGRAPHIC LABS., INC.
440 N. E. 17th St., Miami, Fla. (Tel. FRanklin 9-4242)
Controller: Frank Kovacs, 6300 Euclid Ave., Cleveland, O. (Tel. UTah 1-4664)
Buyer: B. Patterson, Cleveland
V. P.-Sales: D. R. Moore, Miami
TS

NATIONAL-STANDARD CO.
Howard & 8th Sts., Niles, Mich. (Tel. MUtual 3-8100)
V. P.-Purch.: J. A. Mogle
V. P.-Sales: C. F. Scheehle
MF, PS, GS, TR

NATIONAL TEL-TRONICS CORP.
52 St. Casimir Ave., Yonkers, N. Y. (Tel. YOnkers 8-6400)
Purch. Agent: William Jaris
Sales Mgr.: Charles J. Siebert
GE, TR

NATIONAL UNION ELECTRIC CORP.
1201 E. Bell St., Bloomington, Ill. (Tel. 7-6041)
Chief-Purch.: C. Hoover
Sales Mgr.: H. B. Graham
GE, TS, TR

NATIONAL UTILITIES CORP.
826 S. Arroyo Parkway, Pasadena 2, Calif. (Tel. RYan 1-9637)
Dir.-Sales & Purch.: Bert Shilts
Sales Mgr.: Miles Abbott
MF, PS, GS

NATIONAL VULCANIZED FIBRE CO.
Box 311, Wilmington 99, Del. (Tel. OL 5-6371)
Dir.-Purch.: L. R. Clinton
Sales Mgr.: J. R. Kallaher
MF, WN, PS, GE, TR

E. V. NAYBOR LABS., INC.
26 Manorhaven Blvd., Port Washington, N. Y. (Tel. POrt Washington 7-2028)
Pres.: E. V. Naybor
GS, GE, TR

NAZ-DAR CO.
461 Milwaukee Ave., Chicago 10, Ill. (Tel. CHesapeake 3-1630)
Purch.: Seymour Reiger
Sales: R. E. Doran
MF, PS, GS, GE, TS, TR

NEFF INSTRUMENT CORP.
2211 E. Foothill Blvd., Pasadena, Calif. (Tel. RYan 1-5121)
Prod. Mgr.: William P. Shaw
Sales Mgr.: Donald B. Schneider
CO, TS

NELSON VACUUM PUMP CO.
2133 4th St., Berkeley 10, Calif. (Tel. AShberry 3-2277)
Mgr.-Purch.: D. B. Webb
Sales Mgr.: B. J. McClary
GH

NEMETH, INC.
2223 S. Carmelina Ave., Los Angeles 64, Calif. (Tel. BR 2-3271)
Purch. Agent: R. L. Kritser
Sales: Otto R. Nemeth

NEMS CLARKE CO., DIV.-VITRO CORP. OF AMERICA
919 Jesup-Blair Dr., Silver Spring, Md.

(Tel. JUniper 5-1000)
Purch. Agent: O. E. Lanham
Dir.-Sales: J. F. Whitehead
GE, TS, TR

NEOSIL PRODUCTS CO.
745 5th Ave., New York 22, N. Y. (Tel. ELdorado 5-5519)
Purch. Agent: LaV. Beecher
Mgr.-Sales: L. K. Braunston
MF, WN, PS, GE

NETWORK MFG. CORP.
213 W. 5th St., Bayonne, N. J. (Tel. HEmlock 6-9191)
Purch. Agent-Sales: A. A. Mercer
GE, TS, TR

NETWORKS ELECTRONIC CORP.
14806 Oxnard St., Van Nuys, Calif. (Tel. STate 5-8805)
Purch. Agent: Mrs. C. Porter

NEUMADE PRODUCTS CORP.
250 W. 57th St., New York 19, N. Y. (Tel. JUdson 6-5810)
Purch. Agent: John Freeland
Exec. V. P.-Purch. & Sales: L. E. Jones

NEUTRONIC ASSOCIATES
93-14 101st Ave., Ozone Park 17, N. Y. (Tel. VI 7-7703)
Chif Engr.: Jose Hernandez GE

NEW BRITAIN MACHINE CO., THE, PRECISION PRODUCTS DIV.
South St., New Britain, Conn. (Tel. BAldwin 9-1641)
Dir.-Purch.: R. Hulbert
Purch. Agent: J. Devokaitis
Buyer: L. Bourquin
Asst. Purch. Agent: E. Johnson
Sales Mgr.: W. R. Knowles

NEW ENGLAND ELECTRICAL WORKS, INC.
365 Main St., Lisbon, N. H. (Tel. 8-6620)
Exec. Asst.-Purch.: W. W. Jesseman
Treas.: L. H. Dumdey
MF, GS, GH, TR

NEW ENGLAND LAMINATES CO., THE
481 Canal St., Stamford, Conn. (Tel. DAvis 4-4181)
Tech. Dir.-Purch.: Robert J. Hill
Sales Mgr.: Bruce B. Greenfield
MF, WN, PS, GS, GE, TR

NEW ENGLAND SCIENTIFIC INSTRUMENTS CO.
238 Main St., Cambridge 42, Mass. (Tel. KI 7-1997)
Geoffrey Knight, Jr.
PS, GE, CO, TS, TR

NEW ENGLAND TRANSFORMER CO., INC.
47 McGrath Hwy., Somerville 43, Mass. (Tel. SOmerset 6-6100)
V. P. & Gen. Mgr.: H. F. S. Morris

NEW ENGLAND TAPE CO. INC.
30 Tower St., Hudson, Mass. (Tel. HUdson 965) MF, WN, PS, GS, GE

NEW PROCESS METALS, INC.
45-65 Manufacturers Place, Newark 5, N. J. (Tel. MArket 4-1380)
Gen. Mgr.-Purch.: I. S. Hirschhorn
Sales Mgr.: B. M. Berzon PS

NEW YORK AIR BRAKE CO., THE, WATERTOWN DIV.
Starbuck Ave., Watertown, N. Y. (Tel. WAtertown 7700)
Dir.-Purch.: R. R. Petersen
Purch. Asst.: H. A. Hardman
Buyers: P. F. Hoag & R. H. Madden
Gen. Sales Mgr.: H. R. Doughty, Jr.
MF, PS, GS, GE

NEW YORK COIL CO., INC.
Phoenixville, Pa. (Tel. WEllington 3-3114)
Purch.: Miss Doris I. Darlington
Sales: J. R. Zikmund
PS, GS, GE, TS, TR

NEW YORK & NEW JERSEY LUBRICANT CO.
292 Madison Ave., New York, N. Y. (Tel. LExington 2-2851)
Purch. Agent: F. Roettinger PS

NEW YORK SOLDER CO., INC.
684 E. 133rd St., New York 54, N. Y. (Tel. CYpress 2-3740)
Purch.: B. Gottlieb MF, PS, TR

NEW YORK TRANSFORMER CO. INC.
3rd Ave., Alpha, N. J. (Tel. PHillipsburg 5-1143)
Purch. Agent: Carl Seefer
GS, GE, TS, TR

NEWARK WIRE CLOTH CO.
351 Verona Ave., Newark, N. J. (Tel. HUmboldt 3-7700)
Purch. Agent: E. J. Korn
Asst. Purch. Agent: C. P. Haslam
MF, PS, GS, GH, GE, TR

NEWCOMB SPRING OF CONN. INC.
College Hwy., Southington, Conn. (Tel. MArket 8-5581)
Purch.: R. V. Nigro MF, PS, TS, TR

J. M. NEY CO., THE
Drawer 990, Hartford 1, Conn. (Tel. CHapel 2-2281)
Purch. Agent: Ralph Fothergill
Mgr.-Industrial Sales & Engrg.: Kenneth Pitney MF, PS, GS, GE, TR

NICE BALL BEARING CO.
30th & Hunting Park Ave., Philadelphia 40, Pa. (Tel. BAldwin 3-6000)
Purch. Agent: Fred Dimond
V. P.-Sales: Theo E. Spilker

W. H. NICHOLS CO.
48 Woerd Ave., Waltham 54, Mass. (Tel. TWinbrook 4-0650)
Dir.-Purch.: W. E. Neese
Asst. Dir.-Purch.: R. H. Stearns
Sales Mgr.: John Freeto PS, GS, GH

NON-LINEAR SYSTEMS INC.
Del Mar Airport, Del Mar, Calif. (Tel. SKyline 5-1134)
Dir.-Material: Wm. Clemens
Buyers: Marjorie Wheldon & Wm. Foster
V. P.-Sales: Frank C. Strauss
GS, GH, GE, CO, TS, TR

NOOTER CORP.
1400 S. 2nd St., St. Louis 4, Mo. (Tel. MAin 1-6000)
Purch. Agent: H. Lurtz
V. P.-Sales: A. Schwarz PS, GS

NOPCO CHEMICAL CO.
Harrison, N. J. (Tel. HUmboldt 3-6200)
Purch.: Foster Jones
V. P.-Sales: W. B. Morehouse
MF, WN, PS, GS

★NORMANDY ELECTRIC WIRE CORP.
125 Second St., Brooklyn 31, N. Y. (Tel. TRiangle 5-9863)
Mktg. Expediter: Lester W. Goody
Purch. Dept.: Milton Imbey
MF, GS, GH, CO, TS, TR
★(See advertisement in this issue)

NORRICH PLASTICS CORP.
107-109 W. 18th St., New York 11, N. Y. (Tel. WA 4-8360)
Purch.: Norman L. Thaw
Tech. Sales Mgr.: Richard E. Thaw

ERNST NORRMAN LABORATORIES
Williams Bay, Wisc. (Tel. CIrcle 5-5516)
Ernst Norrman GS, GE, TS

NORSID MFG. CO., INC., THE
33 Prospect St., Yonkers, N. Y. (Tel. YOnkers 5-8145)
Purch.: Jack Deutsch
Sales: Harold Deutsch MF

NORTH AMERICAN AVIATION, INC.
(See Autonetics Div., Missile Development Div., Rocketdyne Div.)

NORTH ATLANTIC INDUSTRIES, INC.
603 Main St., Westbury, N. Y. (Tel. EDgewood 4-1122)
Purch. Agent: Walter Lipkin
PS, GS, GE, CO, TS, TR

NORTH ELECTRIC CO.
553 S. Market St., Galion, O. (Tel. 2-4201)
Purch. Agent: C. L. Snyder
PS, GS, GE, TR

NORTH HILLS ELECTRIC CO., INC.
402 Sagamore Ave., Mineola, N. Y. (Tel. Pioneer 7-0555)
GS, GE, CO, TS, TR

NORTH SHORE NAMEPLATE INC.
214-27 Northern Blvd., Bayside, N. Y. (Tel. BAyside 4-4000)
Sales Mgr.: Harry H. Weir

NORTHAM ELECTRONICS, INC.
2420 N. Lake Ave., Altadena, Calif. (Tel. RY 1-9378)
Dir.-Purch.: Mrs. Vivian F. Johnson
Asst. to Purch. Agent: Mrs. Angela V. Hill
Contract Admin.: Edmund D. Lucas, Jr.
PS, CO, TS, TR

NORTHEAST ELECTRONICS CORP.
Airport Rd., Concord, N. H. (Tel. CA 5-6641)
Purch.: D. C. Syphers
V. P.-Sales: E. A. Slusser GS, TS

NORTHEASTERN ENGRG. INC.
25 S. Bedford St., Manchester, N. H. (Tel. NAtional 2-6485)
Purch. Agent: G. A. Murch
Sales Mgr.: R. M. Durmer CO, TS

NORTHERN ENGRG. LABORATORIES, INC.
372 Wilmot Ave., Burlington, Wisc. (Tel. ROckwell 3-7155)
Pres. & Sales Mgr.: John D. Holmbeck
GE

NORTHERN PLASTICS CORP.
2nd Market St., La Crosse, Wis. (Tel. 4-6070)
Purch. Agent: S. L. Noe
Sales: R. B. Haugen MF, PS, GE, TS, TR

NORTHROP AIRCRAFT, INC.
P. O. Box 1525, 9756 Wilshire Blvd., Beverly Hills, Calif. (Tel. ORegon 8-9111)

NORTHWESTERN ELECTRIC CO.
1750 N. Springfield Ave., Chicago 47, Ill. (Tel. DIckens 2-4400)
Purch. Agent: Paul Christiansen
Gen. Sales Mgr.: George D. Craig, Jr.
GS, GH

NORTON ASSOCIATES, INC.
P. O. Box 96, Garden City, N. Y. (Tel. IV 3-2968)
V. P.-Sales: R. S. Norton GE, TR

NORTON CO.
New Bond St., Worcester 6, Mass. (Tel. SW 8-2511)
Gen. Purch. Agent: G. D. Seguin
Chief Buyer: H. H. Anderson
Dir.-Sales: R. M. Johnson
MF, WN, PS, GS, GE

CODING	
Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

NU STEEL CO.
1714 S. Ashland Ave., Chicago 8, Ill. (Tel. HAymarket 1-5760)
Pres.: Lew W. Cleminson

NUCLEAR CORP. OF AMERICA, INC.
400 Park Ave., New York 22, N. Y. (Tel. PLaza 8-0700)
Purch. Agent-Central Electronics: Michael Buff, Rockaway, N. J. (Tel. 9-4200)
Purch. Agent-NRD Instrument Co.: Karl Wolf, St. Louis, Mo. (Tel. WOodland 2-2162)
Sales: Sam Norris

NUCLEAR MEASUREMENTS CORP.
2464 N. Arlington Ave., Indianapolis 18, Ind. (Tel. Liberty 6-2415)
Purch. Agent: James L. Sommerville
Chief Engr.: Herbert S. Fall
Gen. Sales Mgr.: Cort L. Kegley

NUCLEAR PRODUCTS-ERCO, DIV.-ACF INDUSTRIES
Riverdale, Md. (Tel. WArfield 7-4444)
Purch. Agent: R. C. Nill
Sr. Buyers: E. T. Wagner & J. J. Dye
Mktg. Mgr.: Conan J. Doyle
MF, WN, GS, GH, GE, TS, TR

NUCLEAR-CHICAGO CORP.
223 W. Erie, Chicago, Ill. (Tel. DE 7-3060)
Purch. Agent: Robert Young
V. P.: John Kuranz

NUTT-SHEL CO.
811 Airway, Glendale 1, Calif. (Tel. CItrus 4-4191)
Purch. Agent: P. Welch
Chief Sales Engr.: R. C. Poucher
MF, PS

O & M MACHINE CO., INC.
7421 E. Slauson Ave., Los Angeles 22, Calif. (Tel. PArkview 8-2181)
Purch. Agent: A. M. Foster
Sales: Axel Dodson
MF, WN, PS, GS, GH, GE, TS, TR

OPW-JORDAN CORP.
6013 Wiehe Rd., Cincinnati 13, Ohio (Tel. EL 1-1352)
Asst. Plant Mgr.: M. H. Hott
Chief Sales Engr.: P. H. Coleman
Sales Engrs.: A. M. Ottesen & R. J. Peters
Gen. Mgr.: G. B. Richards, Jr.
GS, GH

O & S RESEARCH, INC.
1811 Bannard St., Riverton, N. J. (Tel. TA 9-2800)
Purch. Agent: Edward R. Sanders
Sales Mgr.: Donald G. Wright
WN, PS, GS, GH, GE, CO, TS, TR

OAKITE PRODUCTS, INC.
19 Rector St., New York 6, N. Y. (Tel. WHitehall 3-0940)
Purch. Agent: S. L. Remlein
Gen. Sales Mgr.: F. L. Oldroyd
MF, WN, PS, GS, GH

OERLIKON TOOL & ARMS CORP. OF AMERICA
P. O. Box 3049, Asheville, N. C. (Tel. ALpine 3-6464)
Chief-Procurement: William L. Hayes

OFFNER ELECTRONICS INC.
5320 N. Kedzie Ave., Chicago 25, Ill. (Tel. IRving 8-7067)
Purch. Dept. Head: H. Lewis
V. P.-Purch.: Irving Hoffman
Sales Mgr.: G. W. Little
GE, CO, TS, TR

OHIO CARBON CO., THE
12508 Beren Rd., Cleveland 11, O. (Tel. CL 2-4380)
Purch. Agent: R. Hawrylak
V. P.-Sales: F. C. Aurand
MF, PS, GS, GE, TR

OHIO PISTON & MACHINING CO., THE
5340 Hamilton Ave., Cleveland 14, Ohio (Tel. EXpress 1-7400)
Purch. Agent: C. J. Winter
Sales Mgr.: C. F. Buker
MF, PS, GS, GH

OHIO PRECISION CASTINGS, INC.
109 Webb St., Dayton 3, O. (Tel. CLearwater 3-4183)
Pres.-Treas.: W. J. Prestel MF, PS

OHIO SEAMLESS TUBE DIV.-COPPERWELD STEEL CO.
Shelby, O. (Tel. 3-1010)
Purch. Agent: R. R. Underhill
Asst. Purch. Agent: R. W. Winck
Mgr.-Sales: J. E. Horner MF, PS

OIL-DYNE, INC.
2115 W. Marquette Rd., Chicago 36, Ill. (Tel. HEmlock 4-2300)
Purch. Agent: Andrew Pappas

OIL-RITE CORP.
2318 Waldo Blvd., Manitowoc, Wisc. (Tel. MUrray 2-2428)
Purch. Agent: Gus Lukas
Sales Mgr.: Merwin R. Scheider GS

OKONITE CO., THE
220 Passaic St., Passaic, N. J. (Tel. PRescott 7-0400)
Dir.-Purch.: K. T. Gordon
V. P.-Mktg.: C. M. Kirkland
MF, PS, GS, GH, CO, TS, TR

OLIN MATHIESON CHEMICAL CORP., HIGH ENERGY FUELS DIV.
P. O. Box 480, Niagara Falls, N. Y. (Tel. BUtler 4-7811)
Purch. Dir.: J. C. Pfisterer
Mgr.-Customer Relations: G. Richard Lott
MF, WN, PS, GS, GH, GE

OLYMPIC PLASTICS CO., INC.
3471 S. La Cienega Blvd., Los Angeles 16, Calif. (Tel. TExas 0-1121)
Purch. Agent: Robert Calhoon
V. P.-Purch.: D. C. Siteman
Sales Mgr.: H. M. Rome
MF, PS, GS, GH, GE

OMEGA LABS., INC.
Haverhill St., Rowley, Mass. (Tel. WHitney 8-7757)
Treas.: H. B. Ribbel GE, CO, TS, TR

D. W. ONAN & SONS INC.
2515 University Ave., S. E., Minneapolis 14, Minn. (Tel. FE 2-1155)
Dir.-Procurement: H. P. Richter
Mgr.-Purch. Dept.: L. V. Moen
V. P.-Sales: Hiram Hascall

ONONDAGA POTTERY CO., ELECTRONICS DIV.
1858 W. Fayette St., Syracuse 1, N. Y. (Tel. HOward 8-1681)
Purch. Agent: Richard W. Gaudern
Asst. Dir.-Chg. Sales: P. L. Christensen
GS, GE, TR

ONSRUD MACHINE WORKS, INC.
7746 Lehigh Ave., Niles 31, Ill. (Tel. 7-8700)
V. P.: A. L. Breuer MF, WN, PS, GS

OPAD ELECTRIC CO.
69 Murray St., New York, N. Y. (Tel. BEekman 3-7548)
Gen. Mgr.: Henry L. Opad
MF, GS, GH, GE, CO, TS, TR

OPELIKA WELDING, MACHINE & SUPPLY INC.
P. O. Box 310, Opelika, Ala. (Tel. SHerwood 5-3524)
Purch. Agent: J. P. Byrd
Engr.-Purch.: Wm. S. Harris
V. P.-Sales: C. Foster
MF, PS, GS, GH

OPTIMIZED DEVICES, INC.
P. O. Box 38 Cedney Sta., White Plains, N. Y. (Tel. WIsconsin 7-3798)
Purch.: Arthur Zuch
GS, GE, CO, TS, TR

OPTOMECHANISMS INC.
216 E. 2nd St., Mineola, N. Y. (Tel. Pioneer 6-5576)
Purch. Agent: John Ferrante
Exec. V. P.-Sales: J. Harvey McCoy
GS, GH, GE, CO, TS, TR

★OPTO-METRIC TOOLS, INC.
137 Varick St., New York 13, N. Y. (Tel. ORegon 5-9076)
Sales Mgr.: A. A. Crystle
Gen. Mgr.: F. Koenig
GS, GE, CO, TS, TR
★(See advertisement in this issue)

ORANGE ROLLER BEARING CO., INC.
557 Main St., Orange, N. J. (Tel. ORange 3-6161)
Sales: T. E. Cushing
MF, WN, PS, GH, GE

ORBITRAN CO., INC.
Rt. 1, Box 635, Lakeside, Calif. (Tel. HIckory 3-6832)
Gen. Mgr.: E. W. Fischer

ORGANIC DEVELOPMENT CORP., SPECTRA-STRIP DIV.
10052 Larson Ave., Garden Grove, Calif. (Tel. JEfferson 7-4530)
Sales Mgr.: John Ford GS, GH, TR

ORRADIO INDUSTRIES, INC.
Shamrock Circle, Opelika, Ala. (Tel. SHerwood 5-5771)
Purch. Agent: Thad McEachin
V. P.-Sales: Nat Welch TR

ORTHO FILTER CORP.
196 Albion Ave., Paterson, N. J. (Tel. MUlberry 4-5858)
Purch. Agent: W. Levine
Sales: George G. Pagonis GE, TR

ORTMAN-MILLER MACHINE CO. INC.
19 143rd St., Hammond, Ind. (Tel. WEstmore 1-1710)
Gen. Mgr.: A. H. Ortman PS, GS

ORYX CO.
9015 Wilshire Blvd., Beverly Hills, Calif. (Tel. BRadshaw 2-6635)

OSBORNE ELECTRONIC SALES CORP.
712 S. E. Hawthorne Blvd., Portland 14, Ore. (Tel. BElmont 2-0161)
Purch. Agent: C. E. Stonecipher
V. P.-Sales Mgr.: Robert E. Mitchell
GS, GE, TS, TR

★JOHN OSTER MFG. CO., AVIONIC DIV.
One Main St., Racine, Wisc. (Tel. MElrose 3-6331)
Purch. Agent: Roy Arcand
Asst. Purch. Agent: Robert Stratman
Buyers: Ray Carlson, Anthony Methenitis, Roy Woods, Parnell Bjerke & Hugo Zerbe
Eastern Sales Mgr.: Irving G. Epstein
Western Sales Mgr.: Ward S. Carlson
PS, GS, GE, TS
★(See advertisement in this issue)

OVERLOAD CONTROL CO.
260-11 Langston Ave., Floral Park, N. Y. (Tel. Fieldstone 3-7819)
Purch.: R. Ronnie
Sales: Earl Elwyn Smith PS, GS, TS

OWATONNA TOOL CO.
Owatonna, Minn. (Tel. 5591)
Purch. Agent: C. P. Kaplan GS

OWEN LABS., INC.
55 Beacon Pl., Pasadena, Calif. (Tel. RYan 1-6901)
Purch. Agent: W. N. Fellows
Sales Mgr.: Russell E. Quackenbush
GS, GH, GE, CO, TS, TR

OXYGEN EQUIPMENT & SERVICE CO.
8335 S. Halsted St., Chicago 20, Ill. (Tel. HUdson 3-3800)
Purch. Agent: Donald J. Freeburg
Sales Prom. Mgr.: Grover D. Harris
PS, GS, GH, CO, TS

OZONE METAL PRODUCTS CORP.
101-32 101st St., Ozone Park 16, N. Y. (Tel. VIrginia 6-3300)
Purch. Agent: E. Kulick
Buyer: A. Maurici
V. P.-Sales: W. E. Criley
MF, WN, PS, GS, GE, TS, TR

PIC DESIGN CORP., SUB.-BENRUS WATCH CO., INC.
477 Atlantic Ave., E. Rockaway, L. I., N. Y. (Tel. LYnbrook 3-6470)
Purch. Agent: Mrs. T. Balze
Sales: P. Wellenberger
MF, WN, PS, GS, GH, GE, TS, TR

PACE ELECTRICAL INSTRUMENTS CO., INC.
70-31 84th St., Glendale 27, L. I., N. Y. (Tel. DAvenport 6-3982)
Dir.-Purch.: A. S. Weingast
Industrial Sales Mgr.: G. N. Goldberger

PACIFIC ALLOY ENGRG. CORP.
400 Raleigh Ave., El Cajon, Calif. (Tel. HIckory 4-6148)
Purch. Agent: S. L. Collier
Sales: Oscar Eggen MF, PS, GE

PACIFIC AUTOMATION PRODUCTS, INC.
1000 Air Way, Glendale, Calif. (Tel. CHapman 5-6871)
Purch. Agent: Roland Eatrom
Chief Liaison Engr.-Sales: William W. Buckley GS, GH, TR

PACIFIC COAST ENGRG. CO.
Oak & Clement Sts., P. O. Drawer "E", Alameda, Calif. (Tel. LA 2-6100)
Purch. Agent: M. H. LaRue
Gen. Sales Mgr.: J. P. Tepley

PACIFIC CUT WASHER CO.
2501 E. 56th St., Huntington Park, Calif. (Tel. LUdlow 3-6781)
Gen. Mgr.: J. R. Bougher
MF, WN, PS, GS

PACIFIC DIV.-BENDIX AVIATION CORP.
11600 Sherman Way, N. Hollywood, Calif. (Tel. POplar 5-1010)
Dir.-Purch.: R. R. Zimmerman
Telemetering Sales Mgr.: E. W. Copeland
Electronics Sales Mgr.: H. D. Wilkinson
Hydraulic Sales Mgr.: J. G. Weldon
MF, PS, GS, GH, GE, CO, TS, TR

PACIFIC MOULDED PRODUCTS CO.
905 E. 59th St., Los Angeles 1, Calif. (Tel. ADams 1-1151)
Mgr.-Purch.: George Hoffman
Sales Mgr.: C. E. Wilson
MF, WN, PS, GE

PACIFIC RESISTOR CO.
1881 S. Sepulveda Blvd., Los Angeles 25, Calif. (Tel. GR 9-1412)
Purch.: H. A. Guiness GE, TR

PACIFIC SCIENTIFIC CO.
P. O. Box 22019, Los Angeles 22, Calif. (Tel. LUdlow 3-1121)
Dir.-Sales & Serv., Aeronautical Div.: Andre W. Reichel

PACIFIC TUBE CO.
5710 Smithway St., Los Angeles 22, Calif. (Tel. RAymond 3-1331)
Purch. Agent: W. H. Kepp
Sales Mgr.: W. P. Armstrong MF

PACIFIC UNIVERSAL PRODUCTS CORP.
168 Vista Ave., Pasadena, Calif. (Tel. RYan 1-7646)
Mgr.: Charles Chopnick
MF, PS, GS, GH, GE, CO, TS, TR

★PACKARD-BELL ELECTRONICS CORP.
12333 W. Olympic Blvd., Los Angeles 64, Calif. (Tel. BRadshaw 2-2171)
Mgr.-Material: Wm. Winckler
Purch.: A. R. Curry
Chief-Sales & Contracts Admin.: Hugh L. Vick GS, GH, CO, TS
★(See advertisement in this issue)

PACKARD ELECTRIC DIV.-GENERAL MOTORS CORP.
Dana St., Warren, O. (Tel. 3250-1)
Procurement Mgr.: D. E. Tritten
Buyers: L. Raymond Clutter, K. F. Dymond, G. E. Gibbons, H. H. Grebe
Gen. Sales Mgr.: R. U. Montgomery
MF, PS, GS, GH, GE, TS, TR

PACO ELECTRONICS CO., INC.
70-31 84th St., Glendale 27, L. I., N. Y. (Tel. DAvenport 6-3982)
Dir.-Purch.: A. S. Weingast
Sales Mgr.: J. M. Kirshbaum

PALMER THERMOMETERS, INC.
2502 Norwood Ave., Cincinnati, O. (Tel. ME 1-1500)
Purch. Agent: S. Rolfsen
Sales & Adv. Mgr.: Douglas H. Hitt
PS, GE, CO, TS, TR

PANORAMIC RADIO PRODUCTS, INC.
520 S. Fulton Ave., Mt. Vernon, N. Y. (Tel. OWens 9-4600)
V. P.-Purch.: Samuel Kleinman
MF, PS, GS, GE, CO, TS, TR

PAPER MFGRS. CO.
9800 Bustleton Ave., Philadelphia 15, Pa. (Tel. ORchard 3-4500)
Dir.-Purch.: J. Walker
Chicago Fld. Sales Reps.: Robert J. Moore & Samuel Der Bois, 510 N. Dearborn St., Chicago, Ill.
N. Y. State (Northern) Fld. Sales Rep.: Don Carroll, 308 Collins Ave., Fayetteville, N. Y.
N. Y. & N. J. Fld. Sales Rep.: Joseph I. Shields (Tel. N. Y. C.—DIgby 9-3720)
N. Y. C. & New England Fld. Sales Rep.: Charles R. Weber, Philadelphia TR

PAPESCH & KOLSTAD, INC.
P. O. Box 3726, 10707 Capital Ave., Oak Park 37, Mich. (Tel. LIncoln 7-6400)
V. P.-Purch: M. R. Papesch
MF, WN, PS, GS, TS

PARAGON ELECTRIC CO.
1600 12th St., Two Rivers, Wisc. (Tel. 303)
Purch. Agent: G. J. Powalish
V. P.-Sales: Read W. Eldred CO

PARAGON-REVOLUTE CORP.
77 South Ave., Rochester 4, N. Y. (Tel. BAker 5-2480)
Purch. Agent: W. T. Nurse
Sales Mgr.: L. G. Booth

PARAMETERS, INC.
195 Herricks Rd., New Hyde Park, N. Y. (Tel. Pioneer 6-0155)
Sales Mgr.: John R. Crawford
MF, PS, GS, GE, TS

PARAMOUNT PAPER TUBE CORP.
614 S. Lafayette St., Ft. Wayne 2, Ind. (Tel. A-4197)
Gen. Mgr.: R. R. Weimer MF, PS

PARISH PRESSED STEEL, DIV.-DANA CORP.
Box 1422, Robeson & Weiser Sts., Reading, Pa. (Tel. FRanklin 3-4211)
Dir.-Purch.: E. R. Kohl
Purch. Agent: W. H. Fahnestock
Buyers: C. R. Kline & E. Hartman
Sales Mgr.: S. L. Whitehall
MF, WN, PS, GS, GH

PARK NAMEPLATE CO., INC.
34-10 Linden Pl., Flushing 54, N. Y. (Tel. FLushing 9-7000)
Purch. Agent: Charles Birnbach
V. P.-Sales: David Kend MF

PARKER AIRCRAFT CO.
5827 W. Century Blvd., Los Angeles 45, Calif. (Tel. OR 8-1221)
Purch. Agent-Check Div.: R. Fix
Purch. Agent-Fuel Div.: W. Parker
Purch. Agent-Hydraulics Div.: W. Zimmerman
Sales Mgr.: A. V. Zukas
MF, PS, GS, GH, GE

PARKER- HANNIFIN CORP., PARKER RUBBER DIV.

PAKER-HANNIFIN CORP., PARKER FITTINGS & HOSE DIV.

PARKER-HANNIFIN CORP., PARKER HYDRAULICS DIV.
17325 Euclid Ave., Cleveland 12, O. (Tel. KEnmore 1-3000)
Gen. Purch. Agent-Parker-Hannifin: H. H. Krause
Purch.-Parker Fittings & Hose Div.: F. A. Jenkins
Purch.-Parker Rubber Div.: E. Luckas
Purch.-Parker Hydraulics Div.: E. J. Anderson
Gen. Sales Mgr.-Parker-Hannifin: D. A. Cameron

PARKER-HARTFORD CORP., THE
650 Franklin Ave., Hartford, Conn. (Tel. CHapel 6-1651)
Purch. Agent: Thomas H. Daley
Sales Mgr.: Wesson C. Miller PS

RALPH M. PARSONS CO., THE, ELECTRONICS DIV.
151 S. De Lacey Ave., Pasadena, Calif. (Tel. Los Angeles—RYan 1-0461)
Mgr.-Proc.: Daniel M. Ogden
Mgr.-Bus. Dev.: Edson C. Lee
GS, GE, CO, TS, TR

PARTS ENGRG. CO., INC.
760 N. Marshall Ave., El Cajon, Calif. (Tel. HIckory 4-9481)
Purch. Agent: B. York
Sales Mgr.: M. M. Van Dyke
MF, WN, PS, GS, GH

PATTERSON FOUNDRY & MACHINE CO., THE
1250 St. George St., P. O. Box 743, East Liverpool, O. (Tel. FUlton 5-2400)
Purch. Dir.: C. E. Schneider
Chief Buyer: J. E. Doherty
Dir.-Sales: Everett A. Sisson
MF, WN, PS, GS, GE, TR

PATTERSON, MOOS DIV.-UNIVERSAL WINDING CO., INC.
90-28 Van Wyck Expressway, Jamaica 18, N. Y. (Tel. AXtel 7-4400)
Purch. Agent: Howard L. Abeel
WN, PS, GS, GH, GE, CO, TS, TR

F. H. PAUL & STEIN BROTHERS, INC.
235 5th Ave., New York 16, N. Y. (Tel. MU 4-6370) PS

PAUL & BEEKMAN, INC.
1801 Courtland St., Philadelphia 40, Pa. (Tel. DAvenport 9-9050)
Purch. Agent: Thomas J. Mount
V. P.-Sales: J. E. Schmidt
MF, WN, PS, GS, GH, GS, TS, TR

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

HOWARD E. PAYNE
56 Beaverbrook Dr., Dayton 32, Ohio (Tel. CHapel 4-5600)
Consultant & Representative

PEARSON ELECTRONICS
707 Urban Lane, Palo Alto, Calif. (Tel. DA 5-3147)
Dr. Paul A. Pearson GE

PECK & HARVEY MFG. CORP.
5650 N. Western Ave., Chicago 45, Ill. (Tel. ED 4-2200)
Purch. Agent: Burt Kemp
Sales Mgr.: S. A. Harvey

PEERLESS ELECTRONICS INC.
5338 Alhambra Ave., Los Angeles, Calif. (Tel. CApitol 1-5196)
Sales: Robert Monroe MF, PS

PEERLESS PHOTO PRODUCTS INC.
Tesla Rd., Shoreham, N. Y. (Tel. 4-2817)
Purch. Agent: Pat Hajek
Sales: Arthur Taber GS

PEERLESS PRODUCTS INDUSTRIES
812 N. Pulaski Rd., Chicago 51, Ill. (Tel. BElmont 5-9883)
Buyer: Walt Griffing
Sales Mgr.: V. Mathews
MF, WN, PS, GS, GE, TR

PEIRCE DICTATION SYSTEMS
5900 N. Northwest Hwy., Chicago 31, Ill. (Tel. ROdney 3-3220)
V. P. & Supt.-Purch.: Emil C. Steinbach
Purch. Agent: Stanley L. Domin TR

★PENBERTHY MFG. CO.
1242 Holden St., Detroit 2, Mich. (Tel. TRinity 5-0900)
Sales Mgr.: Howard Strohmaier
GS, CO, TS
★(See advertisement in this issue)

PENETONE CO., THE
Tenafly, N. J. (Tel. LOwell 7-3000)
Purch. Agent: H. R. Haskell
Asst. Purch. Agent: C. Goldberg
V. P.-Chg. Sales: H. E. Roberts
WN, PS, GS, GH

PENN FIBRE & SPECIALTY CO., INC.
2024 E. Westmoreland St., Philadelphia 34, Pa. (Tel. REgent 9-4862)
V. P.-Sales: William K. Davis
MF, WN, PS, GE, TR

PENN-MICHIGAN MFG. CORP.
220 S. Kirk St., West Lafayette, Ohio (Tel. 5-6311)
Purch. Agent: L. F. Howbert
Pres.: E. F. Rickelman

PENNSYLVANIA PUMP & COMPRESSOR CO.
Easton, Pa. (Tel. 3-4276)
Purch. Agent: R. Beadell
Sales Mgr.: W. E. Anderson GS, GH

PENN-TRAN CORP.
E. Bishop St., Ext., Bellefonte, Pa. (Tel. ELgin 5-4747)
Purch. Agent: E. E. Grine
Secy.-Treas.: N. H. Krauss

PENTA LABS., INC.
312 N. Nopal St., Santa Barbara, Calif. (Tel. WOodland 5-4581)
Purch. Agent: J. D. Thwing
Sales Mgr.: R. L. Norton GE, TR

PERFECTION INDUSTRIES, DIV.-HUPP CORP., MOBILE PRODUCTS DEPT.
1135 Ivanhoe Rd., Cleveland 10, O. (Tel. ULster 1-6200)
Purch. Agent: W. H. Mansfield
Buyers: D. Fetzer & H. H. Haldeman

PERFECTO CAST
5660 Kearney Villa Rd., San Diego 11, Calif. (Tel. BRowning 7-6711)
Purch.: L. P. Kehres MF, PS

PERFORMANCE MEASUREMENTS CO.
15301 W. McNichols Rd., Detroit 35, Mich. (Tel. VErmont 8-7879)
Purch. Agent: Harry Edwards
Sales Engr.: Louis H. Larime TS

PERKIN ENGRG. CORP.
345 Kansas St., El Segundo, Calif. (Tel. OR 8-7215)
Purch. Agent: Pat Cerella
Sales Prom. Mgr.: George W. Mousel
PS, GS, GE, TR

PERKIN-ELMER CORP.
Main Ave., Norwalk, Conn. (Tel. VIctor 7-2422)
Dir.-Purch.: Patrick O'Gorman
Asst. Purch. Agent: George Hodge
Electronic Buyer: Arthur Cummings
Buyers: William Douda & David Fournier
Sales-Eng. & Opt. Div.: John D. Winninghoff
Sales-Instrument Div.: Paul C. Hutchinson
Sales-Vernistat Div.: Eugene W. Dunstan
WN, PS, GS, GH, GE, CO, TS, TR

PERMAG CORP.
214 Taaffe Pl., Brooklyn 5, N. Y. (Tel. MAin 2-0114)
Pres.: L. T. Sherwood GS, GE, TS, TR

PERMANENT FILTER CORP.
1800 W. Washington Blvd., Los Angeles 7, Calif. (Tel. REpublic 1-7381)
Chief Purch. Agent: Gardner Reynolds
Acting Sales Mgr.: Corte F. Truax

PERMAX PRODUCTS DIV., CHISHOLM-RYDER CO., INC.
Highland & College Ave., Niagara Falls, N. Y. (Tel. 9186)
Dir.-Purch.: Larry Fischer
Mgr.-Permax Div.: B. B. Mitchell

PERMOFLUX PRODUCTS CO.
4101 San Fernando Rd., Glendale 4, Calif. (Tel. CH 5-5111)
Purch. Agent: S. H. Ise
Sales: R. W. Gutherie
GS, GH, GE, CO, TS, TR

PERMONITE MFG. CO.
444 Lake Shore Dr., Chicago 11, Ill. (Tel. MIchigan 2-1915)
Purch. Agent: H. B. Laufer
Asst. Purch.: S. Boss
Sales Mgr.: A. L. Kaye

PESCHEL ELECTRONICS, INC.
R.F.D. 1, Patterson, N. Y. (Tel. TRinity 8-3251)
Pres.: Stephen S. Peschel
GS, GE, CO, TS, TR

PESCO PRODUCTS DIV.-BORG-WARNER CORP.
24700 N. Miles Rd., Bedford, O. (Tel. Cleveland-MOntrose 2-2100)
Mgr.-Purch.: H. L. Sanders
Buyers: George Weidinger, William Erwin & John Lander
Gen. Sales Mgr.: D. R. Spotz
MF, PS, GS, GH, GE

PETCH MFG. CO.
S. Shore Rd., Alpena, Mich. (Tel. 1400)
Purch. Agent: C. R. Meharg
Head-Sales: W. W. Hutch, 463 York St., Detroit 2, Mich. (Tel. Tri. 1-4240)
MF, PS, GS, TS

PETERSON & NEVILLE INC.
365 Dorchester Ave., Boston, Mass. (Tel. AN 8-2548)
Purch. Agent: Dolph Dufresne
V. P.-Sales: Wm. N. Weickert
MF, GS, GH

PETTIBONE MULLIKEN CORP.
4700 W. Division St., Chicago, Ill. (Tel. SPaulding 2-9300)
Purch. Agent: T. M. Cavender
Asst. Purch. Agent: H. T. Samuels
Steel Buyer: C. R. Slocum
Fabricated Parts Buyers: W. D. Vice & W. C. Hinz
Non-Ferrous Metals Buyer: A. J. Salmon
Sales: J. M. Hume MF, WN, GS

PHAOSTRON INSTRUMENT & ELECTRONIC CO.
151 Pasadena Ave., S. Pasadena, Calif. (Tel. CLinton 5-1471)
Purch. Agent: Al Lowenstein
V. P.-Sales: W. A. Beswick
WN, PS, GS, GE, CO, TS, TR

PHELPS DODGE COPPER PRODUCTS CORP.
300 Park Ave., New York, N. Y. (Tel. PLaza 1-3200)
Purch. Agent: P. G. Lee
Mgr.-Styroflex Cable Div.-Sales: F. W. Lemly
GS, GH, CO, TS

PHILADELPHIA GEAR WORKS, INC.
Erie Ave. & G St., Philadelphia, Pa. (Tel. GA 6-9400)
Purch. Agent: Mr. Marts
Sales Mgr.: Howard Murray PS, GS

PHILADELPHIA SCIENTIFIC GLASS CO.
R.D. 1, Paletown Rd., Quakertown, Pa. (Tel. KEystone 6-4203)
Sales Mgr.: Frank Bender
MF, PS, GS, GE, TS, TR

GEORGE A. PHILBRICK RESEARCHES, INC.
230 Congress St., Boston 10, Mass. (Tel. (HUbbard 2-3225)
Purch. Agent: John Dowd
Sales & Appl. Engrg.: Daniel H. Sheingold
PS, GS, GE, CO, TS, TR

PHILCO CORP., GOVERNMENT & INDUSTRIAL DIVS.
4700 Wissahickon Ave., Philadelphia 44, Pa. (Tel. TEnnessee 9-4000)
Purch. Mgr.: John R. McAllister
Mktg. Mgr.-Govt. Prods.: Frank D. Langstroth
MF, PS, GS, GH, GE, CO, TS, TR

PHILCO CORP., LANSDALE TUBE CO. DIV.
Church Rd., Lansdale, Pa. (Tel. ULysses 5-4681)
Purch. Agent: A. G. McIlvaine
Buyers: Alan Dayton, W. R. Lewis, J. McBreen, R. Haughs & E. C. Lutz
Asst. Buyer: Mary Bartholemew
Gen. Sales Mgr.: Cyrus H. Warshaw

PHILIPS & DAVIES INC.
1030 Steiner Ave., Kenton, O. (Tel. 2-1120)
Purch. Agent: G. R. Leoffert
V. P.-Sales: J. W. Stuckey
MF, WN, GS, GH, TS

PHILLIPS AVIATION CO.
1525 Monterey Rd., S. Pasadena, Calif. (Tel. RYan 1-1181)
Sales: Howard P. Ladd MF, PS, GH

★PHOENIX PRODUCTS CO.
4715 N. 27th St., Milwaukee, Wis. (Tel. UP 1-1680)
Purch. Agent: H. W. Heard
Asst. Mgr., Metal Spinning Div.: Edwin Weiss MF, WN, PS, GS, GE
★(See advertisement in this issue)

PHOTOBELL CO., INC.
43 Vesey St., New York 7, N. Y. (Tel. WOrth 2-6739)
Purch. Agent: S. Faber
Gen. Mgr.: A. Edelman
MF, GH, GE, CO, TS, TR

PHOTOCIRCUITS CORP.
31 Sea Cliff Ave., Glen Cove, N. Y. (Tel.

GLen Cove 4-8000)
Purch. Agent: Wm. B. Sherriff
Sales Mgr.: Alan P. Kingsbury GE

PHOTOCON RESEARCH PRODUCTS
421 N. Altadena Dr., Pasadena, Calif. (Tel. SYcamore 2-4131)
Buyer: P. J. Davison
Sales Engr.: Howard W. Gates
PS, GS, GE, CO, TS, TR

PHOTOVOLT CORP.
95 Madison Ave., New York 16, N. Y. (Tel. MUrray Hill 6-3350)
Purch. Agent: H. W. Lindemann
V. P.-Sales: B. A. Silard CO, TS

PHOTRON INSTRUMENT CO.
6516 Detroit Ave., Cleveland 2, O. (Tel. ATlantic 1-7020)
Sales: M. A. Fayerweather
CO, TS, TR

PIASECKI AIRCRAFT CORP.
Island Rd., International Airport, Philadelphia 42, Pa. (Tel. SAratoga 7-9750)
Purch. Agent: James F. Guckes
Buyers: William M. Collins & A. C. Ryan

PICKERING & CO., INC.
Sunnyside Blvd., Plainview, L. I., N. Y. (Tel. OVerbrook 1-0200)
Purch.: Richard Neuffer
GS, GE, CO

PIERCE GOVERNOR CO., INC., THE
1625 Ohio Ave., Anderson, Ind. (Tel. 3-5331)
Purch. Agent: E. Browning
Sales Mgr.: L. E. Boren PS, GS

PIEZO PRODUCTS CO.
Whitney St., Sherborn, Mass. (Tel. TR 9-9497)
Pres.: D. MacDougall PS, GS, CO

PIONEER ALUMINUM INC.
5251 W. Imperial Hwy., Los Angeles 45, Calif. (Tel. ORegon 8-7621)
Purch. Agent: K. R. Cannon
V. P.-Sales: Vern Ammerman
MF, PS, GH

PIONEER TOOL & ENGRG. CO.
7401 W. Lawrence Ave., Chicago 31, Ill. (Tel. UNderhill 7-7500)
Sales Engr.: Jack Piel

PIONEER-CENTRAL DIV., BENDIX AVIATION CORP.
Hickory Grove Rd., Davenport, Iowa (Tel. DAvenport 7-9101)
Dir.-Purch.: George Thomas
Asst. Dir.-Purch.: Vernon Dick
Sr. Buyers: Donald Patrick & William Hiegel
Buyer: Robert Lindsay
Dir.-Sales & Serv.: I. H. MacMillan
MF, WN, PS, GS, GH, GE, CO, TS, TR

PITMAN MFG. CO.
300 W. 79th Terrace, Kansas City, Mo. (Tel. DE 3-3530)
Purch. Mgr.: Dick Doty
V. P.: A. D. Moore

PLASTIC AGE SALES, INC.
14300 Davenport Rd., Saugus, Calif. (Tel. NEwhall 1530)
Purch. Agent: Adolf Kramer
Sales Mgr.: H. E. Renner
MF, WN, PS, GS

PLASTIC CAPACITORS, INC.
2620 N. Clybourn Ave., Chicago 14, Ill. (Tel. DIversey 8-3735)
V. P.-Purch.: Peter H. Berry
Purch.: Robert Tamkin
Sales: Millard Leff GS, GE, TR

PLASTOID CORP.
42-61 24th St., Long Island City 1, N. Y. (Tel. STillwell 6-6200)
Purch. Agent: Ernest Brown

Asst. Purch. Agent: Abe Rosenberg
Sales-Serv. Mgr.: Don J. Nichols, Hamburg, N. J. (Tel. Van Dyck 7-7141)
MF, PS, GS, GH, CO, TS, TR

PNEU-HYDRO VALVE CORP.
364 Glenwood Ave., East Orange, N. J. (Tel. ORange 7-1200)
Purch. Agent: George T. Stern
Sales Mgr.: James W. Reilly
PS, GS, GH, GE

POLARAD ELECTRONICS CORP.
43-20 34th St., Long Island City 1, N. Y. (Tel. EXeter 2-4500)
Dir.-Purch.: L. Lieberman
Buyers: Jack Marks, B. Flax, I. Wasserman, & D. Rosenbloom
Sales Mgr.: A. A. Goldberg
GS, GH, GE, CO, TS, TR

JOSEPH POLLAK CORP.
81 Freeport St., Boston 22, Mass. (Tel. AVenue 2-9550)
V. P.-Purch. Agent: Henry L. Brandt
Asst. Purch. Agents: James J. Burns & Joseph F. Connolly
Sales Mgr.-Electronics Div.: Harold A. MacDonald GS, GE, TR

POLYMER CORP., THE
2120 Fairmont Ave., Reading Pa. (Tel. FRanklin 6-7241)
Purch. Agent: Paul T. Border
Sales Mgr.: Robert E. Barthold
MF, WN, PS, GS, GE, TR

POLYPHASE INSTRUMENT CO.
E. 4th St., Bridgeport, Montgomery Co., Pa. (Tel. BRoadway 9-4660)
Purch. Agent: D. C. Morris
Sales Mgr.: D. J. Seifert GE, CO, TS

POLY-SCIENTIFIC CORP.
P. O. Box 118, Blacksburg, Va. (Tel. PRescott 2-8042)
Purch. Agent: Herbert H. Albert
Exec. V. P.-Purch.: Robert E. Jordan
GE, CO, TR

POMONA ELECTRONICS CO., INC.
1126 W. 5th Ave., Pomona, Calif. (Tel. NAtional 9-9549)
Purch. & Sales Mgr.: Carl Wm. Musarra
MF, GH, GE, CO, TS, TR

POROLOY EQUIPMENT, INC.
14943 Califa St., Van Nuys, Calif. (Tel. STate 6-2670)
Purch. Agent: D. S. Draves
Dir.-Sales & Engrg.: W. N. Caldwell
PS, GS, GH

H. K. PORTER INC.
74 Foley, Somerville 43, Mass. (Tel. PRospect 6-8200)
Purch. Agent: W. E. Coffey
V. P.-Sales: H. M. Webster
MF, WN, PS, GS, TS

PORTLAND COPPER & TANK WORKS INC.
80 2nd St., S. Portland, Me. (Tel. SPruce 9-3341)
Purch. Agent: Willard Jones
Buyer-Special Prods. Div.: John Curran
Sales Mgr.: Harry Higgins
MF, WN, PS, GS, GH, GE

POSITIVE LOCK WASHER CO., THE
Avenue A & Miller St., Newark 5, N. J. (Tel. BIgelow 3-8460)
Gen. Mgr.: Fred J. Goll

POTTER AERONAUTICAL CORP.
U. S. Rt. 22, Union, N. J. (Tel. MUrdock 6-3010)
Purch. Agent: Harry Carlson
V. P.-Sales: Irving Hirsch
PS, GS, GE, CO, TS, TR

POTTER & BRUMFIELD INC.
Princeton, Ind. (Tel. FUlton 5-5251)
Purch. Agent: Charles Schrader
Asst. Purch. Agent: Everett Cox
Gen. Sales Mgr.: Nelson Havill GE

POTTER CO., THE
1950 Sheridan Rd., N. Chicago, Ill. (Tel. DExter 6-4350)
Purch. Agent: Harold D. Miner
Dir.-Sales: Carl Thoene
PS, GS, GE, TR

POTTER INSTRUMENT CO., INC.
Sunnyside Blvd., Plainview, N. Y. (Tel. OVerbrook 1-3200)
Purch. Agent: W. Gerber
Asst. Purch. Agent: G. Chieco
V. P.-Sales: E. D. Gray TR

★HAROLD H. POWELL CO.
2102 Market St., Philadelphia 3, Pa. (Tel. LOcust 7-5285)
Purch. Agent: Joseph Harris
V. P.: J. Lewis Powell
PS, GS, GE, CO, TS, TR
★(See advertisement in this issue)

POWER SOURCES, INC.
South Ave., Burlington, Mass. (Tel. BRowning 2-3000)
Purch. Agent: Harry Merchant
Buyer: Bob Stetson
Exec. V. P.-Sales: Stanley Golembe
GS, GE, TR

POWERS REGULATOR CO., THE
3400 Oakton St., Skokie 66, Ill. (Tel. OR 3-6700)
Purch. Agent: R. C. Guhr
Asst. Purch. Agents: R. Bennett & V. Wiland

PRECISE DEVELOPMENT CORP.
2 Neil Ct., Oceanside, N. Y. (Tel. RO 6-0171)
Purch.: M. Byron
Sales: C. David TS, TR

PRECISE INSTRUMENT PARTS CO., A CORP.
4520 San Fernando Rd., Glendale 4, Calif. (Tel. CItrus 2-0331)
Purch. Agent: Mary E. FitzSimmons
Gen. Mgr.-Sales: Loretta M. Provost

PRECISION APPARATUS CO., INC.
70-31 84th St., Glendale 27, L. I., N. Y. (Tel. DAvenport 6-3982)
Dir.-Purch.: A. S. Weingast
Sales Mgr.: J. M. Kirshbaum

PRECISION, INC.
730 N. Lyndale Ave., Minneapolis, Minn. (Tel. FRanklin 4-2321)
V. P.-Sales: D. G. Benner
MF, WN, PS, GS, GH, GE, CO, TS, TR

PRECISION CASTINGS, INC.
1550 Superior Ave., Costa Mesa, Calif. (Tel. LIberty 8-2278)
Purch. Agent: Charles R. Salmon
MF, PS

PRECISION CIRCUITS, INC.
705 S. Fulton Ave., Mt. Vernon, N. Y. (Tel. MOunt Vernon 4-3737)
V. P.-Purch.: Herbert L. Schwartz
GS, GE, TS, TR

PRECISION ELECTROPLATING CO.
519 S. Oakley Blvd., Chicago 12, Ill. (Tel. SEeley 3-5855)
James Zacharias MF, WN, PS

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

PRECISION LINE INC.
63 Main St., Maynard, Mass. (Tel. TWin Oaks 7-2451)
Gen. Mgr.: L. M. Burgess GE, TR

PRECISION RESISTOR CO. INC.
109 U. S. Hwy. No. 22, Hillside, N. J. (Tel. BIgelow 3-3809)
L. E. Wright, Jr. GE, TR

PRECISION TUBE CO., INC.
Church Rd. & Wissahickon Ave., North Wales, Pa. (Tel. OXbow 9-4806)
Purch. Agent: Otto Chvoka
Sales Mgr.: Matthew F. Balch, Jr.
MF, PS, GS, GH, CO

H. P. PREIS ENGRAVING MACHINE CO.
651 U. S. Highway 22, Hillside 5, N. J. (Tel. MU 6-7736)
Purch.: M. H. Preis
Prod. Mgr.: J. A. Hoffmann GS

PREMIER METAL PRODUCTS CO.
337 Manida St., New York 59, N. Y. (Tel. WYandotte 1-6600)
Sales: Edwin L. Kossoy
MF, GS, GH, GE, TR

PREMIER RESEARCH LABORATORIES, INC.
79 7th Ave., New York 11, N. Y. (Tel. ALgonquin 5-0700)
Purch. Agent: W. J. Gutman
Sales Mgr.: M. H. Proelsdorfer
GS, GE, TR

PRESSED STEEL TANK CO.
1445 S. 66th St., Milwaukee 14, Wisc. (Tel. GReenfield 6-0500)
Purch. Agent: R. E. Holmes
Mgr.-Industrial Prods. Div.: T. V. Montgomery MF, WN, PS, GS

PRICE ELECTRIC CORP.
E. Church & 2nd Sts., Frederick, Md. (Tel. MOnument 3-5141)
Purch. Agent: Robert H. Haines
Sales Mgr.: Edw. J. Daugherty
GE, TR

PRINT LOID, INC.
93 Mercer St., New York 12, N. Y. (Tel. CA 6-7393)
Secy.-Purch.: A. Minner
Treas.-Sales: J. M. Wodiska
MF, GE, CO, TS, TR

PRINTED ELECTRONICS CORP.
7 North Ave., Natick, Mass. (Tel. OLympic 3-9411)
Purch. Agent: Gilman N. Fernald
V. P.-Sales: Richard G. Zens

PROCESS & INSTRUMENTS
15 Stone Ave., Brooklyn 33, N. Y. (Tel. GLenmore 2-8380)
Office Mgr.: L. Peimer
MF, PS, GS, CO, TS

PRODELIN INC.
307 Bergen Ave., Kearny, N. J. (Tel. KE 2-8600)
Purch.: G. D. Higgins & R. Munley
Sales: L. A. Bondon
GS, GH, GE, TR

PRODUCTION RESEARCH CORP.
Thornwood, N. Y. (Tel. ROgers 9-2766)
Purch. Agent: Robert E. Fornges
Subcontracting: Julius Medalie
Sales: James A. Ford
GS, GE, CO, TS, TR

PROGRESSIVE RESEARCH & DEVELOPMENT CO., INC.
800 E. Elizabeth Ave., Linden, N. J. (Tel. HUnter 6-5700)
Purch. Chief: Garrett Den Bleyker
Sales Mgr.: Joseph E. McDonnell
MF, PS, GS, GH, GE, CO, TS, TR

PROPELLEX CHEMICAL CORP.
P. O. Box 187, Edwardsville, Ill. (Tel. 3400)
V. P.-Purch.: Paul H. Blackmon
Sales: Roy H. Bleikamp
MF, WN, PS, GS, GH, GE

PROPULSION RESEARCH CORP.
1860 Franklin St., Santa Monica, Calif. (Tel. TE 0-7482)
Mgr.-Customer Relations: H. V. Nelson
PS

PROTECTIVE COATINGS, INC.
Box 3985, Detroit 27, Mich. (Tel. VE 6-4664)
H. Tom Collord

PRYOR MARKING PRODUCTS
434 S. Wabash Ave., Chicago 5, Ill. (Tel. HA 7-0495)
Gen. Mgr.: D. J. Wilken GS

PULSE ENGRG. INC.
2657 Spring St., Redwood City, Calif. (Tel. EMerson 8-3331)
Purch. Agent: John Devine GE, TR

PURE CARBON CO. INC.
441 Hall Ave., St. Marys, Pa. (Tel. TE 4-1578)
Purch. Agent: H. W. McGeehin
V. P.-Sales & Engrg.: M. C. Burr
MF, PS, GE, TS

PURITAN COMPRESSED GAS CORP., AVIATION DIV.
2012 Grand Ave., Kansas City 8, Mo. (Tel. HArrison 1-2122)
Aviation Sales Mgr.: F. C. Stebbins
MF, PS, GS, GH

PYLE-NATIONAL CO., THE
1353 N. Kostner Ave., Chicago 51, Ill. (Tel. DIckens 2-6300)
Purch. Agent: Carl Mackprang
Asst. Purch. Agents: Charles Skobel & William Sheridan
V. P.-Sales: C. H. Hobbs
Mgr.-Connector Div. (Missile Prod. Sales): J. Shearer

PYLES INDUSTRIES, INC.
8926 2nd Ave., Detroit 2, Mich. (Tel. TRinity 4-2202)
Purch. Agent: H. T. Gerald
Gen. Mgr.-Sales: C. M. Singleton
PS, GS, GH, GE, TR

PYROFILM RESISTOR CO., INC.
U. S. Highway 46, Parsippany, N. J. (Tel. DEerfield 4-8282)
Pres.: John M. Hinkle GE, TR

PYROMETER INSTRUMENT CO., INC.
92 Portland Ave., Bergenfield, N. J. (Tel. DUmont 4-5140)
Purch. Agent: J. Crystall
Sales: A. Bollerman
MF, PS, GS, CO, TS

Q. O. S. CORP.
Bronx Blvd. at 216th St., New York 67, N. Y. (Tel. OLinville 4-3930)
Purch. Agent: Elliott Reiss
GE, CO, TS, TR

Q. V. S. INC.
20 N. 15th St., E. Orange, N. J. (Tel. ORange 3-3996)
Treas.: Dorothy G. Fogle
GE, CO, TS, TR

QUAKER RUBBER DIV.-H. K. PORTER CO., INC.
Tacony & Comly Sts., Philadelphia 24, Pa. (Tel. JEfferson 3-4800)
Gen. Purch. Agent: T. J. Gorman
Gen. Sales Mgr.: J. R. Alexander
PS, GS

QUICK CHARGE CORP.
1750 N. E. 10th St., Oklahoma City, Okla. (Tel. CEntral 2-9128)
V. P.-Purch. & Sales: C. F. Fletcher
Plant Supt.: Kenneth P. Kerr
Parts & Work Expediter: Alvin Owens
MF, WN, PS, GS, GE, TS, TR

QUINCY COMPRESSOR CO.
217 Maine St., Quincy, Ill. (Tel. BA 2-7700)
Purch. Agent: Richard Busch
Sales Mgr.: Loren Gillhouse GS

RBM DIV.-ESSEX WIRE CORP.
131 Godfrey, Logansport, Ind. (Tel. 5121)
Purch. Agent: C. R. Carr GE

R. C. L. MFG. CO.
New Jersey Ave., Riverside, Burlington Co., N. J. (Tel. HObart 1-1003)
Pres.: Charles T. Gamble

RS ELECTRONICS CORP.
435 Portage Ave., Palo Alto, Calif. (Tel. DAvenport 3-9063)
Purch. Agent: W. E. Regan
Buyer: E. C. Campbell
V. P.-Sales: Robert K-F Scal GE

RADAR DESIGN CORP.
3309 James St., Syracuse 6, N. Y. (Tel. HOward 3-5896)
Pres.: Glyn Bostick
GS, GH, GE, CO, TS, TR

RADAR ENGINEERS
4719 Brooklyn, Seattle 5, Wash. (Tel. LA 5 5335)
Purch. Agent: W. T. Harrold
GS, CO, TS

RADEX CORP.
2076 Elston Ave., Chicago 14, Ill. (Tel. ARmitage 6-6900)
Pres.: R. R. Cook GE, TS

RADIAL CUTTER MFG. CORP.
831 Bond St., Elizabeth, N. J. (Tel. ELizabeth 5-9000)
Purch.: Lucien Revol
Sales: George S. Mackrin

RADIANT LAMP CORP.
300 Jelliff Ave., Newark, N. J. (Tel. BIgelow 3 6850)
Purch.: L. Mocerino
Sales Mgr.: Carl L. Krueger GS, GE

RADIAPHONE CO. INC.
600 E. Evergreen St., Monrovia, Calif. (Tel. ELliott 8-2585)
Purch. Agent: H. E. Adams
Mgr.-Contracts Dept.: W. H. Schetter
MF, PS, GS, GH, GE, CO, TS, TR

RADIATION COUNTER LABS., INC.
5121 W. Grove St., Skokie, Ill. (Tel. ORchard 3-8700)
Purch. Agent: Edward R. Schuch
Sales Mgr.: Charles James Walsh
MF, WN, PS, GS, CO, TS, TR

★RADIATION, INC.
P. O. Box 37, Melbourne, Fla. (Tel. 1800)
Purch. Agent: W. R. Pierpont
Sr. Buyer: J. I. Markham
Electronic Buyers: G. Vandegrift & L. R. Helser
Mechanical Buyer: A. G. George
Indust. Buyer: C. C. Rupp
GS, GE, CO, TS, TR
★(See advertisement in this issue)

RADIATION INSTRUMENT DEVELOPMENT LABORATORY, INC.
5737 S. Halsted, Chicago 21, Ill. (Tel. TRiangle 3-2345)
Dir.-Purch.: L. J. Hartzer
Asst. Dir.: S. O. Saiz
Purch. Agent: J. F. Miller PS, CO, TS

RADIO CONDENSER CO.
Davis & Copewood Sts., Camden, N. J. (Tel. EMerson 5-5500)
Purch. Agent: J. W. Willard
Sales Mgr.: R. A. Butor TR

RADIO CORES, INC.
9540 Tulley Ave., Oak Lawn, Ill. (Tel. GArden 2-3353)
V. P.-Sales: Arthur J. Mark TR

RADIO CORPORATION OF AMERICA, DEFENSE ELECTRONICS PRODUCTS
Front & Cooper Sts., Camden 2, N. J. (Tel. WOodlawn 3-8000)
V. P.-Mktg.: J. M. Hertzberg
GS, GE, CO, TR

RADIO FREQUENCY CO., INC.
Medfield, Mass. (Tel. NOrwood 7-4900)
Pres.: J. G. Manwaring

RADIO INDUSTRIES, INC.
5225 N. Ravenswood Ave., Chicago 40, Ill. (Tel. UPtown 8-6500)
Purch. Agent: Roy Sielisch
GE, TS, TR

RADIO SPECIALTY MFG. CO.
2023 S. E. 6th Ave., Portland 14, Ore. (Tel. BE 2-8123)
Purch. Agent: Ellis R. Schlosser

RADIX WIRE CO.
26260 Lakeland Blvd., Cleveland, O. (Tel. REdwood 1-9191)
Purch. Agent: Albert Faber, Jr.
Sales Mgr.: James B. Irwin MF

RAE MOTOR CORP.
2009 Kewaunee St., Racine, Wis. (Tel. MElrose 3-1196)
Purch. Agent: J. Costabile
V. P.: E. K. Hansen
PS, GS, GH, GE

RAHM INSTRUMENTS, DIV.-AMERICAN MACHINE & METALS, INC.
65 Rushmore St., Westbury, N. Y. (Tel. EDgewood 3-4840)
Purch. Agent: John E. Sullivan
V. P.-Sales: R. White CO, TS

RAILWAY COMMUNICATIONS INC.
9351 E. 59th St., Raytown 33, Mo. (Tel. FLeming 3-2100)
Sales: E. E. Tuel GE, TS, TR

RALEIGH ENGRG. LABORATORY, AMERICAN MACHINE & FOUNDRY CO.
2510 Louisburg Rd., Raleigh, N. C. (Tel. TEmple 4-8465)
Gen. Mgr.: J. A. Bolton

RAM ELECTRONICS INC.
600 Industrial Ave., Paramus, N. J. (Tel. COlfax 1-6900)
Purch. Agent: R. Rubin
V. P.-Sales: M. Mayersohn
GS, GE, TS, TR

RAMO-WOOLDRIDGE CORP., THE
5730 Arbor Vitae St., Los Angeles 45, Calif. (Tel. ORegon 8-0311)
Mgr.-Materiel & Office Serv.: F. M. Brown, Bldg. D, Rm. 1369, 5500 W. El Segundo Blvd., Los Angeles 45, Calif. (Tel. OSborne 5-4651)

DOUGLAS RANDALL INC.
6 Pawcatuck Ave., Westerly, R. I. (Tel. PAwcatuck 5-5757)
Purch. Agent: R. Stokes
Material Control: K. Walsh
MF, PS, GS, GE, CO, TS, TR

RANDALL GRAPHITE BEARINGS, INC.
Box 839, Greenlawn & Lake Sts., Lima, Ohio (Tel. CAtherine 3-1075)
Purch. Agent: Frank O. Burnette
Sales Mgr.: Ray Chaney
WN, PS, GH, GE

RANSOHOFF, INC.
N. 5th St. & Ford Blvd., Hamilton, Ohio (Tel. TW 3-5813)
Purch. Agent: C. V. Noonan
V. P.: R. C. Wigger GS

RATTAN MFG. CO., THE
P. O. Box 1745, 10 Wall St., New Haven, Conn. (Tel. UNiversity 5-2141)
V. P.: G. H. Keith Miller
Sales: George L. Hatheway
MF, WN, PS, GS, GH

RAWAY BEARING CO.
4 Forsyth St., New York 2, N. Y. (Tel. WAlker 5-8150)
Purch.: Rubin Yarmush
Sales: Aharon Baskin
PS, GS, GH, GE

RAYBESTOS-MANHATTAN, INC.
Passaic, N. J. (Tel. GRegory 3-2000)
Adv. Mgr.: S. R. Robinson
Sales Promotion: R. G. Grundy
MF, WN, PS, GS, GH, GE

RAYMOND ENGRG. LABORATORY, INC.
Smith St., Middletown, Conn. (Tel. DIamond 6-7745) WN, GE, TS

RAY-O-VAC CO., DIV.-ELECTRIC STORAGE BATTERY CO.
212 E. Washington Ave., Madison 10, Wisc. (Tel. ALpine 5-7201)
Purch.: O. B. Wynn
V. P.-Mktg.: J. A. McIlnay GS, GE

★RAYTHEON MFG. CO., MISSILE SYSTEMS HEADQUARTERS DIV.
50 Winter St., Waltham, Mass.
Purch. Agent, Andover, Mass.: Frank Samuel
Purch. Agent: Lowell, Mass.: Vincent Sorrentino
Purch. Agent, Bedford, Mass.: Robert H. Pohl
Purch. Agent, Bristol, Tenn.: Theodore Sheldon
Purch. Agent, Oxnard, Calif.: Charles A. Wisenbaker
Purch. Agent, White Sands, N. M.: Harry Leiper
Gen. Purch. Agent: Bruce T. Brace
★(See advertisement in this issue)

REACTION MOTORS, INC.
Denville, N. J. (Tel. ROckaway 9-2323)
Purch. Agent: Ernest DeRome
Purch. Suprvsrs.: Laurance Levy & J. Young
Suprvsr. of Expediting: C. Birckholtz
Purch. Coordinator: J. Daley
V. P.-Mktg.: D. C. Eaton
MF, PS, GS, GH

READY POWER CO., THE
11231 Freud Ave., Detroit 14, Mich. (Tel. VA 2-1717)
Purch. Agent: Henry J. Craska
V. P.-Sales Mgr.: W. S. Jewell
MF, PS, GS

RECORA CO., INC., THE
6100 S. Archer Rd., Summit, Ill. (Tel. GLobe 8-0450)
Purch.: P. Cline
Sales: R. A. Hill GE, TR

RECTICO, INC.
963 Frelinghuysen Ave., Newark, N. J. (Tel. BIgelow 3-8739)
Purch. Agent: F. Fertell GE

RED POINT CORP.
1907 Riverside Dr., Glendale 1, Calif. (Tel. THornwall 2-4895)
Gen. Mgr.: Ralph P. Craig

RED SEAL METALS CO.
10035 Burtis St., South Gate, Calif.
V. P.: E. Angell MF

REDMAN ELECTRONICS CORP.
92 Prospect St., Thompsonville, Conn. (Tel. RIverview 5-8024)
Purch. Agent: David Engleman
GS, GE, TS, TR

REDMOND CO., INC.
201 Monroe St., Owosso, Mich. (Tel. SAratoga 5-5151)
Dir.-Purch.: Glen Baumhardt
Buyers: R. Kircher, B. Wiegel, R. Muehlberger, & M. Carson
Gen. Sales Mgr.: M. J. Koenig
PS, GS, GH, GE, TR

REDSTONE ARSENAL RESEARCH DIV., ROHM & HAAS CO.
Huntsville, Ala. (Tel. JE 6-4411)
Purch.: Alton H. Belcher
Asst. Purch. Agent: Clarence R. Lumpkin
PS

REED & PRINCE MFG. CO.
1 Duncan Ave., Worcester 1, Mass. (Tel. PL 3-2934)
Purch. Agent: Everett C. Loomis
V. P.-Sales: Ernest C. Boyd
MF, WN, PS, GS

REEVE ELECTRONICS, INC.
609 W. Lake St., Chicago 6, Ill. (Tel. RAndolph 6-9755)
Purch. Agent: E. F. Steichmann
Sales: I. R. Wayne MF, PS, GS

REEVES BROTHERS INC., (VULCAN RUBBER PRODUCTS DIV.-REEVES PLASTICS INC.)
1071 6th Ave., New York 18, N. Y. (Tel. PE 6-8600)
Managing Dir.-Plastics: John Karrh
Gen. Mgr.-Vulcan: J. A. Wyatt

REEVES INSTRUMENT CORP.
Roosevelt Field, Garden City, N. Y. (Tel. PIoneer 6-8100)
Purch.: Bernard Paul
V. P.-Sales: C. B. Dewey
PS, GS, GH, GE, CO, TS, TR

REEVES SOUNDCRAFT CORP.
10 E. 52nd St., New York 22, N. Y. (Tel. PLaza 9-2644)
Purch. Agent: Guy Bonham
Sales Mgr.-Audio Div.: George Bassett
Sales Mgr.-Industrial Div.: Wm. A. Morrison

REEVES-HOFFMAN DIV.
Cherry & North Sts., Carlisle, Pa. (Tel. 2480)
Prod. Mgr.: John Marutiak
Sales Mgr.: C. M. Rahn
GS, GE, CO, TS, TR

REFLECTONE CORP., THE
Post Rd. & Myano Lane, Stamford, Conn. (Tel. DAvis 5-2251)
Purch. Agent: Frank G. Hill
Sales Mgr.: John B. Thaler
MF, PS, GS, GE

REGAL PLASTIC CO.
2800 E. 14th, Kansas City 27, Mo. (Tel. BEnton 1-4080)
Purch. Agent: Paul Wilde
V. P.-Sales: J. S. Kivett PS, GS

★REGENT JACK MFG. CO., INC.
11905 Regentview Ave., Downey, Calif. (Tel. LUdlow 7-3225)
Purch. Agents: John Keber & Don Norton
V. P.-Sales: O. A. McPeek
MF, PS, GS, GH
*(See page 000 for advertisement)

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

REICH BROTHERS MFG. CO., INC.
1439 Ash St., Terre Haute, Ind. (Tel. Crawford 9638)
Purch. Agent: Clarence C. Loy
V. P.-Sales: George T. Davis GH

REICHHOLD CHEMICALS, INC.
RCI Bldg., White Plains, N. Y. (Tel. WHite Plains 8-6200) MF, WN

REID METAL PRODUCTS, INC.
2021 N. Lincoln St., Burbank, Calif. (Tel. VIctoria 9-1284)
Supt.-Purch.: Steve Radick
V. P.-Gen. Mgr.: John Bogue
V. P.-Sales: George G. Gaulk
MF, PS, GS, GH, GE

RELAY SALES INC.
Box 186 MM, W. Chicago, Ill. (Tel. West Chicago 1100)
Sales: Anthony Scandora GE, CO, TR

RELIABLE SPRING & WIRE FORMS CO., THE
3167 Fulton Rd., Cleveland 9, O. (Tel. MElrose 1-2800)
V. P.-Sales: Ronald F. Pond
MF, WN, PS, TS, TR

RELIANCE AUTOMATIC LIGHTING CO.
1927 Mead St., Racine, Wisc. (Tel. MElrose 2 6171)
D. F. Flegel GE, CO

RENBRANDT, INC.
6 Parmelee St., Boston 18, Mass. (Tel. HIghlands 5-8910)
Sales: M. Rogers PS, GS, GH

REON RESISTOR CORP.
117 Stanley Ave., Yonkers, N. Y. (Tel. YOnkers 5-9850)
Sales Mgr.: J. J. McCann

REPUBLIC AVIATION CORP., GUIDED MISSILES DIV.
Jericho Turnpike, Mineola, L. I., N. Y. (Tel. PIoneer 2-4013)
Purch. Mgr.: R. Moore
Mil. Contracts: J. Shea
MF, WN, PS, GS, GH, GE, TS, TR

★REPUBLIC MFG. CO.
15655 Brookpark Rd., Cleveland 11, O. (Tel. CLearwater 2-1800)
Purch. Agent: R. Riley
V. P.-Sales: L. J. Henderson
MF, PS, GS, TS
★(See advertisement in this issue)

REPUBLIC STEEL CORP.
Republic Bldg., Cleveland 1, O. (Tel. PRospect 1-1400)
Mgr.-Purch. & Raw Materials: W. T. Adams
Asst. Mgrs. of Purch.: J. H. Graebing & L. H. Ransom
V. P.-Chg. Sales: Norman W. Foy
MF, WN, PS, GS

RESDEL CORP.
Cape May Co. Airport, Wildwood, N. J. Mailing Add.: P. O. Box 217, Rio Grande, N. J. (Tel. WIldwood 2-5643)
Office Mgr./Secy.-Treas.: John F. Dieffenderfer
MF, PS, GS, GH, GE, TS

RESDEL ENGRG. CORP.
330 S. Fair Oaks Ave., Pasadena, Calif. (Tel. RYan 1-7689)
Purch. Agent: J. P. Moran
Chief Engr.-Sales: Alfred J. Siegmeth
PS, GS, GH, GE, CO, TS, TR

RESE ENGRG., INC.
731 Arch St., Philadelphia 6, Pa. (Tel. WAlnut 2-5841)
Chief Purch. Agent: Lee Cotler
GS, CO, TS, TR

★RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
20 S. Union St., Lawrence, Mass. (Tel. MUrdock 8-6011)
Mgr.: Glenn W. Inman
Mgr.-Mktg.: R. D. Davis
MF, WN, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

RESEARCH APPLIANCE CO.
Rt. 8 & Craighead Rd., Allison Park, Pa. (Tel. STerling 2-2262)
Purch. Agent: C. W. Thomas
PS, GS, GH, GE, CO, TS, TR

RESEARCH CONTROLS
7902 E. 11th St., Tulsa, Okla. (Tel. TEmple 5-7163)
Sales: Roy Horton
MF, PS, GS, GH, GE, TS

RESEARCH DEVELOPMENT MFG. INC.
429 E. Collom St., Philadelphia, Pa. (Tel. GLadstone 5-9700)
Purch. Agent: A. G. Kamm
Asst. Purch. Agent: Frank Wm. Doll
Treas.: L. Kassvan MF, WN, PS, GS

RESEARCH, INC.
115 N. Buchanan Ave., Hopkins, Minn. (Tel. Minneapolis WEst 5-2156)
Purch. Agent: G. N. Butzow CO, TS

RESEARCH PRODUCTS CORP.
1015 E. Washington Ave., Madison 10, (Tel. ALpine 6-0621)
V. P.-Chg. Sales: A. W. Brown
PS, GS

RESISTOFLEX CORP.
Roseland, N. J. (Tel. CAldwell 6-7700)
Purch. Agent: Reuben Atkins
V. P.-Sales: Herman Krebs
MF, WN, PS, GS

REVERE COPPER & BRASS INC.
230 Park Ave., New York 17, N. Y. (Tel. MU 9-6800)
V. P.-Gen. Sales Mgr.: R. P. Winberg
MF, PS, GS, GH

REVOLVATOR CO.
Tonnele Ave. & 86th St., North Bergen, N. J. (Tel. UNion 9-1220)
Purch. Agent: J. F. Taylor
Sales: H. S. Germond III

REX CORP., THE
Hayward Rd., West Acton, Mass. (Tel. COlonial 3-7721)
Buyer: S. M. Coyne
MF, WN, PS, GS, GH, GE, CO, TS, TR

REZ-COAT OF CALIF.
690 N. Lemon St., Orange, Calif. (Tel. Kellogg 8-1197)
Prod. Mgr.: D. A. Yeomans
Sales: Bruce Brown MF, WN, PS

★RHEEM MFG. CO., AIRCRAFT DIV.
11711 Woodruff Ave., Downey, Calif. (Tel. TOpaz 1-9711)
Mgr.-Purch.: Robert Lassman
Sales Mgr.: Ray Price
MF, PS, GS, GH
★(See advertisement in this issue)

★RHEEM MFG. CO., ELECTRONICS DIV.
7777 Industry Ave., Rivera, Calif. (Tel. TOpaz 1-9271)
Dir.-Purch.: Roy Smith
Div. Sales Mgr.: Hugh C. Bream
GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

RICHARDS ELECTROCRAFT, INC.
4432 N. Kedzie Ave., Chicago 25, Ill. (Tel. COrnelia 7-4011)
Sales: Stephen G. Richards
MF, GS, GH, GE, TR

RICHMONT, INC.
922 S. Myrtle Ave., Monrovia, Calif. (Tel. ELliott 9-2555)
Purch. Agent: J. F. Hubbard
Sales Mgr.: M. McLean GS

RIGGS NUCLEONICS CO.
717 N. Victory Blvd., Burbank, Calif. (Tel. VIctoria 9-2481)
Pres.: Harvey Riggs GS, CO, TS

RIVETT LATHE & GRINDER INC.
P. O. Box 7, Brighton 35, Mass. (Tel. STadium 2-4530)
Purch. Agent: W. C. Woodworth
Sales Mgr.-Hydraulic Div.: J. A. Marsh
MF, PS, GS

ROANWELL CORP.
662 Pacific St., Brooklyn 17, N. Y. (Tel. MAin 2-2121)
Purch. Agent: H. Schmidt GS, TR

C. F. ROARK WELDING & ENGRG. CO., INC.
Brownsburg, Ind. (Tel. ULrick 2-2224)
Purch. Agent: W. S. Schenck
Sales Mgr.: M. E. Mann
Factory Mgr.: Glen Seeds

ROBBINS AVIATION, INC.
2350 E. 38th St., Los Angeles 58, Calif. (Tel. LUdlow 9-5221)
Dir.-Materiel: R. E. Bixler
V. P.-Engrg. & Sales: H. N. Mabery
PS, GS, GH

ROBERTS TOLEDO RUBBER CO., THE
4143 Monroe St., Toledo 13, O. (Tel. GReenwood 9-4466)
Pres.: Robert Roberts
MF, PS, GS, GE

ROBINS INDUSTRIES CORP.
214-26 41st Ave., Bayside 61, N. Y. (Tel. BAyside 5-4200)
Purch. Agent: E. DiCarlo TR

ROBINSON AVIATION, INC.
Teterboro, N. J. (Tel. ATlas 8-2500)
Purch. Agent: Bruce Mackay
Buyers: Howard Kagan & Arthur Cassidy
V. P.-Proj. Dev.: H. Erich Nietsch
MF, PS, GS, GE, CO, TS, TR

ROBOT APPLIANCES INC.
7041 Orchard St., Dearborn, Mich. (Tel. TIffany 6-2623)
Purch. Agent: K. Krake
MF, PS, GS, GH, GE, TR

ROCHESTER DIV., AMERICAN MACHINE & FOUNDRY CO.
4800 Dewey St., Rochester, N. Y. (Tel. CHarlotte 2-5080)
Gen. Mgr.: H. E. Oles

★ROCHESTER MFG. CO. INC.
113 Rockwood St., Rochester 10, N. Y. (Tel. BRowning 1-2020)
Purch. Agent: L. A. Mumford
V. P.: C. L. Hastings PS, GE, CO, TS
★(See advertisement in this issue)

ROCKBESTOS PRODUCTS CORP.
Nicoll & Canner Sts., New Haven 4, Conn. (Tel. STate 7-1141)
Dir.-Purch.: C. A. Berlepsch
Purch. Agent: R. B. Miniter
V. P.-Chg. Sales: H. O. Anderson
PS, GS, GH, TS, TR

ROCKETDYNE DIV., NORTH AMERICAN AVIATION, INC.
6633 Canoga Ave., Canoga Park, Calif. (Tel. DIamond 7-5651)
Purch. Agent: M. J. Dubuc
Gen. Supvrs.-Purch.: V. L. Butterbaugh, S. C. Schultz & B. L. Weber
Dir.-Plans & Programs: E. F. Brown
PS, GS, GH

RODNEY METALS INC.
1357 Rodney French Blvd., New Bedford, Mass. (Tel. WY 6-5691)

V. P.: C. W. Smith
Purch. Agent: L. A. Dobson
MF, PS, GS, GH

JOHN A. ROEBLING'S SONS CORP.
640 S. Broad St., Trenton, N. J. (Tel. EXport 6-6511)
Dir.-Purch.: R. K. Spofford
Asst. Dir.-Purch.: K. S. Dickel
Buyers: J. G. Hottinger, C. G. Bennighoff, J. R. Nemeth, W. P. Strohauer & P. S. Toth
V. P.-Sales: E. George Hartmann
MF, PS, GS, GH

ROFLAN CO., THE
Rt. 17, Topsfield, Mass. (Tel. TUcker 7-2321)
Purch. Agent: William F. Dooley
WN, GS, GE, CO, TS, TR

ROGERS CORP.
Rogers, Conn. (Tel. PRescott 4-9605)
Purch. Agent: Austin R. Schillinger
Dir.-Sales: Benjamin B. Levy
MF, WN, PS, GE, TR

ROHR AIRCRAFT CORP.
Foot of H St., Chula Vista, Calif. (Tel. GArfield 2-7111)
Materiel Mgr.: C. R. Campbell
Purch. Agent-Engine Equip.: J. W. O'Reilly
Purch. Agent-Outside Mfg.: K. R. Aiken
Raw Materials Purch.: J. F. Moore
Contracts Mgr.: A. R. Campbell
MF, WN, PS

ROLL FORMED PRODUCTS CO.
3760 Oakwood Ave., Youngstown, O. (Tel. SWeetbriar 9-3223)
Purch. Agent: S. Kakish
Sales Mgr.: L. C. Colleran
MF, WN, PS, GS, TS, TR

ROLLER BEARING CO. OF AMERICA
Sullivan Way, W. Trenton, N. J. (Tel. EX 3-7191)
Purch. Agent: R. J. McCoy
Sales Mgr.: Robert R. Voorhees
PS, GH, GE

ROLLWAY BEARING CO., INC.
541 Seymour St., Syracuse 4, N. Y. (Tel. GR 5-2121)
Purch. Agent: William R. Bowes
Gen. Sales Mgr.: Alfons Alven GE

ROME CABLE CORP.
Ridge St., Rome, N. Y. (Tel. ROme 3000)
Purch. Agent: S. O. Williams
Sales Mgr.: D. H. Thayer
GS, GH, GE, TS, TR

RONAN & KUNZL, INC.
502 S. Kalamazoo Ave., Marshall, Mich. (Tel. STory 1-2861)
Purch. Agent: Jack Lawler
Cryogenic Sales Engr.:
Herbert A. Eichstaedt
MF, PS, GS, GH

RONAN & KUNZL, INC., CRYOGENIC DIV.
Marshall, Mich. (Tel. STory 1-2861)
Purch. Agent: Jack Lawler
Sales: H. E. Eischstaedt WN, PS, GS

ROOVERS-LOTSCH CORP.
3611 14th Ave., Brooklyn 18, N. Y. (Tel. GEdney 5-0004)
Chief Engr. & Gen. Mgr.:
Charles F. Lotsch
Plant Supt.: Paul D. Payne
MF, PS, GS

ROSAN, INC.
2901 W. Coast Hwy., Newport Beach, Calif. (Tel. LIberty 8-5533)
Purch. Agent: E. L. Rogers
Exec. V. P.-Sales: S. E. Ridderhof
MF, WN, PS

ROSEMOUNT ENGRG. CO.
9424 Lyndale Ave., S., Minneapolis 20, Minn. (Tel. TUxedo 1-2685)
Secy.-Treas.: Vernon H. Heath
Sales: Frank D. Werner
PS, GE, TS, TR

CHARLES ROSS & SON CO., INC.
148-156 Classon Ave., Brooklyn 8, N. Y. (Tel. MAin 2-8400)
Purch. Agent: Bruno Rivenburg

MILTON ROSS METALS CO., THE
501 Davisville Rd., Southampton, Pa. (Tel. ELmwood 7-4939)
V. P.: E. D. Ross
Pres.: M. I. Ross
MF, WN, PS, GS, GH, GE, CO, TS, TR

ROTARY LIFT CO., DIV.-DOVER CORP.
1054 Kansas St., Memphis 2, Tenn. (Tel. WHitehall 8-8561)
V. P.-Purch.: W. E. Rier
Sales Mgr.-Elevator Div.: H. G. Sanders
Sales Mgr.-Industrial Div.: H. T. Hamm

ROTEX PUNCH CO., INC.
2350 Alvarado St., San Leandro, Calif. (Tel. LOckhaven 9-8180)
Prod. Mgr.: Darwin Spolyar
Sales Mgr.: John B. Sweeney GS

ROTOTEST LABS., INC.
2803 Los Flores Blvd., Lynwood, Calif. (Tel. NEvada 6-9238)
Purch. Agent: Mrs. Tim Taylor
V. P.-Sales: J. R. Duncan TS

ROTRON MFG. CO.
Schoonmaker Lane, Woodstock, N. Y. (Tel. ORiole 9-2401)
Purch. Agent: G. W. Howland
Sales Mgr.: David Carlson
GH, GE, TR

ROWE INDUSTRIES
1702 Wayne St., Toledo, O. (Tel. WAlbridge 5666)
Purch. Agent: Howard B. Lang
Gen. Mgr.-Sales: Harold M. Klopping
MF, WN, PS, GS, GH, GE, TS, TR

MILTON ROY CO.
1300 E. Mermaid Lane, Philadelphia 18, Pa. (Tel. CHestnut Hill 7-8000)
Purch. Agent: E. W. Brook
Sales Mgr.: John Procopi
PS, GS, GH, CO, TS

ROYAL ELECTRIC CORP.
95 Grand Ave., Pawtucket, R. I. (Tel. PAwtucket 2-8600)
Purch. Agent: H. Spanglet
V. P.-Sales Operations: S. B. Alperin
MF, WN, PS, GS, GH, CO, TS, TR

ROYAL INDUSTRIES, INC.
1035 Westminster Ave., Alhambra, Calif. (Tel. ATlantic 9-5101)
Purch. Agent: Victor Kail
V. P.-Sales: R. T. Lowrie
MF, WN, PS, GS, GH, GE, TS

ROYCO INSTRUMENTS
720 Arthur St., Albany 10, Calif. (Tel. LAndscape 4-2868)
Bus. Mgr.-Purch. & Sales:
David G. Hoffman
Dir.-Purch.: F. Roy Gustavson
PS, CO, TS

RUBATEX DIV., GREAT AMERICAN INDUSTRIES INC.
Bedford, Va. (Tel. 2611)
Purch. Agent: Mary B. Dean
Sales Mgr.: W. C. Walters
MF, PS, GE, TR

RUBBER & ASBESTOS CORP.
225 Belleville Ave., Bloomfield, N. J. (Tel. PIlgrim 8-1300)
Purch. Agent: Mrs. A. Golden
Gen. Sales Mgr.: Harold Greene
MF, WN, PS, GE

RUBBERCRAFT CORP. OF CALIFORNIA
1800 W. 220th St., Torrance, Calif. (Tel. FAirfax 8-5402)
V. P.-Sales: Robert N. Merralls
MF, WN, PS, GS, GH, GE, CO, TS, TR

RUCKER CO., THE
4700 San Pablo Ave., Oakland 8, Calif. (Tel. OLympic 3-5221)
V. P.-Gen. Mgr.: Clarence J. Woodard
GS, TS

RUSSELL MFG. CO., THE
Middletown, Conn. (Tel. DIamond 6-7721)
Purch. Agent: Henry Fischer, Jr.
Dir.-Automotive Research & Mfg.:
H. C. Morton
Dir.-Research, Textile Div.: T. I. Read
V. P.-Sales: L. S. Sullivan

RUTHERFORD ELECTRONICS CO.
8944 Lindblade St., Culver City, Calif. (Tel. TExas 0-4362)
Purch. Agent: S. Cooper
Sales: C. E. Rutherford PS, GS, TR

RUTHMAN MACHINERY CO., THE
1813 Reading Rd., Cincinnati 2, O. (Tel. MA 1-5462)
V. P.-Purch.: A. H. Ruthman

RYAN AERONAUTICAL CO.
2701 Harbor Dr., San Diego 12, Calif. (Tel. CYpress 6-6681)
Materiel Mgr.: M. K. Smith
Dir.-Customer Relations: Clark Hickerson
MF, WN, PS, GS, GH, GE, CO, TS, TR

★RYAN INDUSTRIES
888 E. 70th St., Cleveland 3, Ohio (Tel. UT 1-6878)
Purch. Agent: Carl Breitmayer
Mgr.-Engrg.: D. M. Wilkinson
Sales Mgr.: J. M. Kane
MF, PS, GS, GH
★(See advertisement in this issue)

JOSEPH T. RYERSON & SON, INC.
16th & Rockwell Sts., Chicago 8, Ill. (Tel. ROckwell 2-2121) MF, PS

RYTRON CO., INC.
7303 Lankershim Blvd., N. Hollywood, Calif. (Tel. POplar 5-0756)
Purch. Agent: Jack Kennedy
Dir.-Engrg.: Robert E. Schlegel
Chief Engr., Filters: Carl Nelson
Chief Engr., Mag. Amplifier:
Charles Temple
Sales Mgr.: Norman Haffly
PS, GE, CO, TS, TR

SKF INDUSTRIES, INC.
Front St. & Erie Ave., Philadelphia 32, Pa. (Tel. GArfield 6-6400)
Gen. Purch. Agent: F. E. Whyte
Purch. Agent: J. R. Bremer
Suprvsr.: W. R. Sine
Buyers: B. F. Maurer, J. A. McCarron, W. R. Conlogue, & J. A. Choman
Expeditor: D. P. Haggerty PS, GE

SAFEWAY HEAT ELEMENTS, INC.
680 Newfield St., Middletown, Conn. (Tel. DIamond 6-6601)
Secy.-Asst. Treas.: Joseph F. O'Rourke
PS, GS

CODING	
Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

SAGE ELECTRONICS CORP.
302 N. Goodman St., Rochester 7, N. Y. (Tel. GReenfield 3-5770)
Pres.: F. D. Sage GE, TR

SAGE EQUIPMENT CO. INC.
30 Essex St., Buffalo, N. Y. (Tel. ELmwood 5242)
Purch.: A. Sperduli
Sales: John Haynes

SAGE LABS., INC.
159 Linden St., Wellesley 81, Mass. (Tel. CEdar 5-4760)
Admin. Suprvsr.: William S. Patsos
GS, GH, GE, CO, TS, TR

ST. JOHN X-RAY LABORATORY
Califon, N. J. (Tel. 49) TS

ST. MARYS CARBON CO.
State St., St. Marys, Pa. (Tel. TErminal 4-2844)
Purch. Agent: C. J. Ehrensberger
Sales Mgr.: L. W. Eberl
MF, WN, PS, GS

ST. REGIS PAPER CO., PANELYTE DIV.
261 Madison Ave., New York 16, N. Y. (Tel. OXford 7-4400)
Purch. Agent: F. P. Yaccarino, Sr., N. Enterprise Ave., Trenton 4, N. J. (Tel. EXport 2-2181)
Industrial Sales Mgr.: John M. Zeier

SAN FERNANDO ELECTRIC MFG. CO.
1509 1st St., San Fernando, Calif. (Tel. EMpire 1-8681)
Purch. Agent: Richard A. Griffis

SANBORN CO.
175 Wyman St., Waltham 54, Mass (Tel. TW 4-6300)
Purch. Dir.: E. A. Craddock
V. P.-Sales: A. E. Lonnberg
GE, CO, TS, TR

SANCOR CORP.
1661 Franklin Ave., El Segundo, Calif. (Tel. ORegon 8-5069)
Purch. Agent: A. H. Knight
V. P.-Sales: L. H. Sanderfer
GS, GH, TS

SANDERS ASSOCIATES, INC.
95 Canal St., Nashua, N. H. (Tel. TUxedo 3-3321)
Purch. Agent: C. Goldthwaite
Mgr.-Field Force: R. F. Willett
GS, GE, CO, TS, TR

SANGAMO ELECTRIC CO.
11th & Converse, Springfield, Ill. (Tel. 4-6411)
Purch. Agent-Springfield, Ill.: H. C. Chambers
Purch. Agent-Pickens Div., Pickens, S. C.: R. W. Kreppert (Tel. 6311)
Purch. Agent-Ordill Div., Marion, Ill.: Rex McCluskey (Tel. 231)
Mgr.-Elect. Comp. Sales: H. L. Kunz
GS, GH, GE, CO, TS, TR

SARATOGA INDUSTRIES
Ballston Ave., P. O. Box 422, Saratoga Springs, N. Y. (Tel. 4100)
Dir.-Purch.: J. Zamore
PS, GS, GE, CO, TS, TR

SARGENT ENGRG. CORP.
2533 E. 56th St., Huntington Park, Calif. (Tel. LUdlow 3-4161)
Purch. Agent: C. A. Brock
Contract Admin.: R. A. Thomas
MF, GS, GE

SARKES TARZIAN, INC.
415 N. College Ave., Bloomington, Ind. (Tel. 2-1435)
Purch. Agent: Max Robertson
GS, GE, TS, TR

SAUEREISEN CEMENTS CO.
1045 N. Canal St., Sharpsburg Sta., Pittsburgh, Pa. (Tel. STerling 1-2323)
Mgr.-Purch.: G. W. Read, Jr.
V. P.-Sales: P. F. Sauereisen
MF, WN, PS, TS, TR

SAXONBURG CERAMICS
Saxonburg, Pa.
Gen. Mgr.: George Aderhold

SAYLOR ELECTRIC PRODUCTS CORP.
277 Pierce, Birmingham, Mich. (Tel. JOrdan 6-7122)
Purch.: W. R. Saylor
Sales: B. F. Stiles MF, PS

SCALA RADIO CO.
2814 19th St., San Francisco 10, Calif. (Tel. VA 6-2898)
Purch.: Bruno Zucconi

SCHAFFER AIR INDUSTRIES, INC.
290 N. Henry St., Brooklyn 22, N. Y. (Tel. EVergreen 3-5300)
Purch.: Bernard Schaffer
MF, WN, PS, GS, GH, GE, TS, TR

RAY A. SCHARER & CO.
17411 E. Warren, Detroit 2, Mich. (Tel. TUxedo 2-7172)
Purch.: M. A. Davis
Sales: R. A. Scharer

SCHAUER MFG. CORP.
4500 Alpine Ave., Cincinnati 42, O. (Tel. SYcamore 1-3030)
Purch. Agent: David T. Face
V. P.-Sales: S. E. Wright
GS, GH, GE, TR

SCHLEGEL MFG. CO.
1555 Jefferson Rd., P. O. Box 197, Rochester 1, N. Y. (Tel. HIllside 5-5110)
Dir.-Purch.: James Doris
Asst. Purch. Agent: William Rose
Sales Mgr.: Kenneth C. Schlegel
MF, PS, GS, GH, TR

SCHUTTE & KOERTING CO.
Cornwells Hts., Bucks Co., Pa. (Tel. MErcury 9-0900)
Purch. Agent: C. W. Alsentzer
V. P.-Sales: F. L. Seibold PS, GS

★SCHWEBER ELECTRONICS
60 Herricks Rd., Mineola, L. I., N. Y. (Tel. PIoneer 6-6520)
Buyer: George P. Heller
Sales: Jack Laskin GE
★(See advertisement in this issue)

PETER J. SCHWEITZER, INC.
261 Madison Ave., New York 16, N. Y. (Tel. MUrray Hill 2-8400)
Sales: George D. Burns GE, TR

SCIAKY BROTHERS, INC.
4915 W. 67th St., Chicago 38, Ill. (Tel. POrtsmouth 7-5600)
Buyer: John Bilik
V. P.-Chg. Sales: Maurice Sciaky

SCIENCE HOUSE, INC.
Box 7913, Pittsburgh 16, Pa. (Tel. LOcust 1-5533)
Dir.-Special Serv.: Dr. J. J. Ashenbrenner
Sales: G. K. Marlowe
MF, PS, GS, GE, TS

SCIENTIFIC ENGRG. LAB.
1510 Sixth St., Berkeley 10, Calif. (Tel. LA 4-1678)
Purch. Agent: Mrs. Alberta Proteau
PS, GS, GE, CO, TS

SCIENTIFIC INSTRUMENT CO.
1041 2nd Ave., Detroit 26, Mich. (Tel. WOodward 2-9060)
V. P.-Sales: John E. Peterson
PS, GS, GE, CO, TS, TR

SCIENTIFIC-ATLANTA, INC.
2162 Piedmont Rd., N. E., Atlanta 9, Ga. (Tel. TRinity 5-7291)
Buyer: George Ray
Chief Mechan. Engr.-Purch. Agent: S. F. Hutchins
Chief Elect. Engr.-Purch. Agent: C. H. Currie
Sales Mgr.: William H. Bradley
CO, TS, TR

SCINTILLA DIV., BENDIX AVIATION CORP.
Delaware Ave., Sidney, N. Y. (Tel. SIdney 3-9511)
Purch. Agent: W. B. Wilson
Asst. Purch. Agent: C. L. Kessler
Asst. Purch. Agent-Raw Materials & Castings: C. E. Rodgers
Asst. Purch. Agent-MRO Supp.: L. Johnson
Sales Mgr.: D. B. Morse
MF, PS, GS, GH, GE, CO, TS, TR

SCIOTO SIGN CO.
370 Vine St., Kenton, O. (Tel. 2-1146)
Pres.: Collins M. Shaw

SCOTT AVIATION CORP.
Erie St., Lancaster, N. Y. (Tel. REgent 5100)
Purch. Agent: Kenneth J. Albrecht
Aviation Prods. Mgr.: E. J. Finn
PS, GH

HERMON HOSMER SCOTT, INC.
111 Powder Mill Rd., Maynard, Mass. (Tel. TWin Oaks 7-8801)
Purch. Agent: E. G. Dyett, Jr.
Asst. Purch. Agent: George Jumes
CO, TS, TR

★SCREW PRODUCTS CORP. OF AMERICA
5211 Southern Ave., South Gate, Calif. (Tel. LOrain 6-5141)
Purch. Agent: Albert Jenkins
Sales Mgr.: Walter Cleary MF, WN, PS
★(See advertisement in this issue)

SEALECTRIC SWITCH & RELAY CORP.
6025 N. Keystone Ave., Chicago 30, Ill. (Tel. KEystone 9-7502)
Purch. Agent: J. C. Miller
Sales Mgr.: E. M. Paradise
PS, GS, GH, GE, TS, TR

SEALOL CORP.
460 Post Rd., Providence 5, R. I. (Tel. STuart 1-4700)
Purch. Agent: Nathaniel Burnham
V. P.-Sales Mgr.: Frank Bottomley PS

SEAL-PEEL, INC.
775 Stephenson Hwy., Royal Oak 3, Mich.
Purch. Agent: F. B. Evans
Sales Mgr.: Arthur Aaron

SEAMAN PRODUCTS
120 W. Providencia Ave., Burbank, Calif. (Tel. VIctoria 9-3184)
V. P.-Purch.: A. J. Drusch, Jr.
Purch. Agent: S. Allington
MF, WN, PS, GS, GE

SEAMLESS PRODUCTS CO., INC.
126 11th Ave., New York 11, N. Y. (Tel. ALgonquin 5-2152)
MF, WN, PS, GS, GH, GE

SECO MFG. CO.
5015 Penn Ave., S., Minneapolis 19, Minn. (Tel. WAlnut 6-4545)
Chief Engr.-Purch.: E. A. Bramsen
Sales Mgr.: L. P. Henaman TS

SECON METALS CORP.
7 Intervale St., White Plains, N. Y. (Tel. WHiteplains 9-4757)
Pres.: Eugene Cohn MF, PS, GS, TR

SECURITY PARACHUTE CO.
295 W. 141st Ave., San Leandro, Calif. (Tel. LOckhaven 8-2988)
Gen. Mgr.: John J. Maggi
MF, WN, PS, GS, GE, CO

SEEBURG CORP., THE
1500-38 N. Dayton St., Chicago 22, Ill. (Tel. MIchigan 2-0800)
Purch. Agents:
Walter Metcalf & Ritchie Tredwell
Buyers:
Walter Korzun, Daniel Dolce & George Keller
Asst. V. P.-Contracts: Ernest M. Cassell
GS, GH, GE, CO, TS, TR

SEELEY ELECTRONICS
1060 S. La Brea Ave., Los Angeles 19, Calif. (Tel. WEbster 3-1183)
Warren M. Seeley TR

SELAS CORP. OF AMERICA
Dresher, Pa. (Tel. MItchell 6-6600)
Purch. Agent: J. E. Kerns GS

SEL-REX CORP.
75 River Rd., Nutley 10, N. J. (Tel. NUtley 2-5200)
Purch. Agent: J. R. Ezzo
Exec. V. P.-Sales: S. S. Wilson
MF, WN, PS, GS, GE, CO, TR

SEQUOIA WIRE CO.
2201 Bay Rd., Redwood City, Calif. (Tel. EMerson 9-0331)
Buyer: Ruth Pasca
Gen. Sales Mgr.: M. C. Jafferies
MF, PS, GS, GH, CO, TS, TR

SERVICAIR CO.
1841 Flower St., Glendale, Calif. (Tel. CH 5-5161)
Purch. Agent: B. N. Sherman
Gen. Sales Mgr.: Robert R. Robertson
MF, PS, GS, GH, TS, TR

SERVICE STEEL
Box 532, Detroit 32, Mich. (Tel. WOodward 2-9350)
Dir.-Purch.: F. C. Fisher, Jr.
Sales: R. A. Siewert, 4940 N. Western Ave., Chicago 25, Ill. MF, PS

SERVO CORP. OF AMERICA
2020 Jericho Turnpike, New Hyde Park, L. I., N. Y. (Tel. Fieldstone 3-4100)
Purch. Agent: S. Wojcie
Prod. Sales Mgr.: F. G. Willey
Govt. Sales Mgr.: S. S. Levine
Industrial Sales Mgr.: Jules Cardon
PS, GE, CO, TS, TR

SERVOMECHANISMS, INC.
12500 Aviation Blvd., Hawthorne, Calif. (Tel. ORegon 8-7841)
Purch. Agent: Wayne W. Cowan, Jr.
Sr. Buyer-Major Machine Components: Henry McClune, Jr.
Sr. Buyer-Elect. Non-Standard Components: M. Londay
Sr. Buyer-Precision Gear Assembly, Tooling: Lester Meyer
Dir.-Customer Liaison Dept.: Gordon S. Robinson
MF, PS, GS, GE, CO, TS, TR

SERVOMECHANISMS, INC., MECHATROL DIV.
1200 Prospect Ave., Westbury, L. I., N. Y. (Tel. EDgewood 3-6000)
Purch. Agent: H. Gordy
Sales Mgr.: T. Cataldo
PS, GS, GH, GE, TS, TR

SERVONIC INSTRUMENTS, INC.
640 Terminal Way, Costa Mesa, Calif. (Tel. MIdway 6-2427)
Purch. Agent: Betty O'Halloran
Prod. Mgr.: Edward W. Miltenburg
Sales Mgr.: Patrick S. Chase

SESCO MFG., INC.
4th & Prospect St., Bridgeport, Pa. (Tel. BRoadway 9-4350)
Pres.: S. E. Slaymaker, 3rd
MF, WN, PS, GS, GE, TS

SETCHELL-CARLSON INC.
New Brighton, St. Paul 12, Minn. (Tel. MElrose 3-3131)
Gen. Mgr.: B. T. Setchell
Secy.-Treas.: C. Donald Carlson
V. P.: Alice Chermak

SHANNON LUMINOUS MATERIALS CO.
7356 Santa Monica Blvd., Hollywood 46, Calif. (Tel. HOllywood 7-5509)
Head-Purch.: James R. Alburger
Purch. (Gen.): Iris M. Guider
MF, GS, GE, CO, TR

SHARON STEEL CORP.
Sharon, Pa. (Tel. DI 6-4141)
Dir.-Purch.: J. D. Neuman
Purch. Agent: G. R. McQuiston
Gen. Sales Mgr.: W. J. McCune
MF, PS, GS

SHAW METAL PRODUCTS CORP.
101 Third Ave., Garden City Park, L. I., N. Y. (Tel. Pioneer 6-6650)
Purch. Agent: John W. Worthylake
MF, PS, GS, GH, GE, CO, TS

SHEFFIELD CORP., THE, SUB.-BENDIX AVIATION CORP.
Box 893, 721 Springfield St., Dayton 1, O. (Tel. CLearwater 4-5377)
Purch. Agent: Joseph Geyer
MF, PS, GS, GH, GE, CO, TS, TR

SHELL CHEMICAL CORP.
380 Madison Ave., New York 17, N. Y. (Tel. OXford 7-3311)
Mgr.-Mktg. Serv. Dept.: T. A. Moncure
MF, PS

SHELTERED WORKSHOP
2521 5th St., Santa Monica, Calif. (Tel. EXbrook 9-7741)
Gen. Mgr.: J. E. Anthony
MF, PS, GS, GH, TS

SHENANGO FURNACE CO., THE, CENTRIFUGALLY CAST PRODUCTS DIV.
Dover, O. (Tel. 4-2114)
Purch. Agent: William Hague
Sales Mgr.: Kenneth L. Jansen
MF, WN, PS

T. W. & C. B. SHERIDAN CO.
24701 Crenshaw Blvd., Torrance, Calif. (Tel. DA 6-6702)
V. P.-Gen. Mgr.-West Coast Div.: Landon R. Gray
V. P.-Sales Mgr.: Wm. E. Seaman, Sr. (Tel. DIgby 9-4090)
Dir.-Sales, Aircraft: Charles Frazee
MF, GS

SHIELDING INC.
Box 59, Riverton, N. J. (Tel. TAlmadge 9-1433)
Chief Engr.-Purch.: A. J. Diccian
Sales: J. W. McDonald, Jr.
MF, WN, PS, TR

SHURE BROTHERS, INC.
222 Hartrey Ave., Evanston, Ill. (Tel. DAvis 8-9000)
V. P.-Purch.: M. A. Cope
Buyers: L. Elkin & B. Farber
V. P.-Sales: V. Machin
GS, GE, TS, TR

SHUR-LOK CORP.
879 S. East St., Anaheim, Calif. (Tel. PRospect 4-2773)
Purch. Agent: George A. Masters
Sales: F. W. Rohe MF, PS

SIEBRING MFG. CO.
S. Main St., George, Iowa (Tel. 43)
V. P.: Owen Siebring GS, GH

SIER-BATH GEAR & PUMP CO., INC.
9261 Hudson Blvd., N. Bergen, N. J. (Tel. UNion 9-3000)
Purch. Agent: Martin Naclerio
Sales Mgr.: J. A. Glaser PS, GS, GH

SIERRA ENGRG. CO.
123 E. Montecito Ave., Sierra Madre, Calif. (Tel. ELgin 5-3318)
Purch. Agent: Eugene Toms
Dir.-Sales: F. A. Ritterrath

SIERRACIN CORP., THE
1121 Isabel St., Burbank, Calif. (Tel. VIctoria 9-2421)
Buyer: Miss Helen Tyle
V. P.-Sales Mgr.: J. E. Slatky MF, PS

SIGHTMASTER CORP.-MUTUAL ELECTRONIC INDUSTRIES INC.
50 Aleppo St., Providence, R. I. (Tel. TEmple 1-6200)
Purch. Agent: Arthur Torg
Sales: Gilbert Glass
WN, PS, GE, CO, TR

SIGMA INSTRUMENTS, INC.
170 Pearl St., S. Braintree, Mass. (Tel. VIctor 3-5000)
Purch. Mgr.: Alfred E. Foley
Purch.: Kjell Pehrson
Gen. Sales Mgr.: K. H. Bohaker GE

SIGNAL TRANSFORMER CO.
1661 McDonald Ave., Brooklyn 30, N. Y. (Tel. ESplanade 6-0615)
Purch. Agent: S. Miller
Sales Mgr.: Wm. Brinkley, Jr. GE

SIGNALITE INC.
37-41 Neptune Hwy., Neptune, N. J. (Tel. PRospect 5-2490)
V. P.-Sales: Alvin W. Gershon
GS, GE, TS, TR

SILENT HOIST & CRANE CO.
841 63rd St., Brooklyn 20, N. Y. (Tel. BEachview 8-2525)
Purch. Agent: Anthony Yuzzolino
Sales: M. M. Botnick

SILICONE INSULATION, INC.
1383 Seabury Ave., Bronx 61, N. Y. (Tel. SYcamore 2-4400)
Purch. Agent: D. Singer
MF, WN, PS, GS, GE, TR

SILICONE PRODUCTS DEPT., GENERAL ELECTRIC CO.
Waterford, N. Y. (Tel. ADams 8-3330)
Purch. Agent: Paul Megan
Mgr.-Mktg.: Jerome T. Coe
MF, PS, WN

SILICONE SEALS, INC.
3125 Milwaukee Ave., Chicago 18, Ill. (Tel. KEystone 9-1782)
Secy.: Robert Shatton
Sales: Leonard E. Brown MF, GS, GE

SILICONES DIV.-UNION CARBIDE CORP.
30 E. 42nd St., New York 17, N. Y. (Tel. MUrray Hill 7-8000)
Purch. Agent: J. W. Gordon, Long Reach Silicones Plant, P. O. Box 180, Sistersville, W. Va. (Tel. OLdfield 2-3211)
Asst. Purch. Agent: R. Ankrom, Sistersville
Mgr.-Sales: L. J. Sinnott, N. Y.
MF, WN, PS, GS, TS, TR

CODING	
Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**

SIMMONDS AEROCESSORIES, INC.
105 White Plains Rd., Tarrytown, N. Y. (Tel. MEdford 1-7500)
Purch. Mgr.: T. J. McAdams
Purch. Mgr.-Mfg. Div., Vergennes, Vt.: A. Olson (Tel. TRinity 7-2911)
V. P.-Contracts & Serv.: G. J. McCaul
MF, PS, GS, GH, GE, CO, TS, TR

SIMMONS FASTENER CORP.
N. Broadway, Albany, N. Y. (Tel. 62-5431)
V. P.-Gen. Mgr.: Harry H. Rose MF

SIMONDS SAW & STEEL CO.
470 Main St., Fitchburg, Mass. (Tel. 3-3731)
Purch. Agent: Louis A. Little
MF, WN, PS, GS, GH

SIMPLEX PISTON RING MFG. CO.
12301 Bennington Ave., Cleveland 11, O. (Tel. CLearwater 2-2205) MF, PS

SIMPSON ELECTRIC CO.
5200-18 W. Kinzie St., Chicago 44, Ill. (Tel. EStebrook 9-1121)
Purch. Agent: James Werner
Sales Mgr.: M. O. Buehring
PS, GS, GE, CO, TS, TR

SINCLAIR MFG. CO.
S. Worcester St., P. O. Box 398, Chartley, Mass. (Tel. ATtleboro 1-2627)
Sales Mgr.: Howard C. Brownell
MF, WN, PS, GS

SIOUX RADIO PRODUCTS
100 Douglas Ave., Yankton, S. Dak. (Tel. 3507)
Purch. Agent: C. J. Harm
Sales Mgr.: Mark Bolluyt
GS, GE, TS, TR

SITTLER CORP.
18 N. Ada St., Chicago 7, Ill. (Tel. SEeley 3-4616)
V. P.-Purch.: S. J. Lanasa
MF, GS, GH, TS, TR

SKIATRON ELECTRONICS & TELEVISION CORP.
180 Varick St., New York, N. Y. (Tel. WAtkins 4-7060)
Purch. Agent: N. J. Ackerman
Prod. Mgr.: Albert Caputo
Chief Engr.-Sales: William J. Shanahan
MF, PS, GS, GH, GE, CO, TS, TR

SKINNER ELECTRIC VALVE DIV.
95 Edgewood Ave., New Britain, Conn. (Tel. BAldwin 9-4826)
Purch. Agent: C. E. Nelson
V. P.-Sales: D. M. Stevenson
PS, GS, GE

SKINNER PRECISION PRODUCTS
Dunedin, Fla. (Tel. 81-5311)
MF, WN, PS, GS

SKINNER SEAL CO.
3001 Sutter St., Santa Ana, Calif. (Tel. KI 5-5571)
Purch. Agent: Bill Philipson
Gen. Mgr.: Robert T. Skinner
MF, PS, GS, GE

SKYDYNE, INC.
River Rd., Port Jervis, N. Y. (Tel. 3-2241)
Dir.-Purch.: W. F. Maccallum
Buyer: B. E. Marchant
V. P.-Chg. Sales: R. L. Weill
MF, GS, GH

SKYPRODUCTS
P. O. Box 6, Ottsville, Pa. (Tel. FErndale 2-1810 through Easton, Pa.)
Purch. Agent: Robert G. Sheppard
Buyer: Elizabeth Hallet

SKYTRONICS
10515 Burbank Blvd., N. Hollywood, Calif. (Tel. POplar 1-5197)
Gen. Mgr.: C. D. Besore
Prod. Mgr.: Donald R. Sargent
Sales Mgr.: Rex O. Pirkle
MF, WN, PS, GS, GH, GE, TS, TR

SLAUGHTER CO., INC.
Piqua 18, O. (Tel. PRospect 3-5936)
Secy.-Treas.: F. O'Keefe

★SLIP RING CO. OF AMERICA
3612 W. Jefferson Blvd., Los Angeles 16, Calif. (Tel. REpublic 5-0253)
Purch. Agent: William Young
Gen. Mgr.: C. L. Cross
MF, PS, GH, GE, TR
★(See advertisement in this issue)

SMALL MOTORS INC.
2076 Elston Ave., Chicago 14, Ill. (Tel. ARmitage 6-6900)
Pres.: R. R. Cook PS, GS, GE, TS

L. B. SMITH AIRCRAFT CORP.
P. O. Box 456, International Airport Br., Miami 48, Fla. (Tel. TUxedo 8-8481)
Mgr.-Materials: Lloyd G. Culbertson
Purch. Agent: George Ceglar
Buyer: Doyle Leonard
V. P.-Aircraft Sales & Serv.: George R. Dutton

SMITH-MORRIS CORP.
825 Myrtle St., Ferndale, Mich. (Tel. JOrdan 6-3124)
Purch. Agent: L. Gnich
Sales Mgr.: G. W. Smith
MF, WN, PS, GS, GH, GE

SMOOTH-ON MFG. CO.
572 Communipaw Ave., Jersey City 4, N. J. (Tel. HEnderson 3-0076)
V. P.: J. H. Tompkins
Gen. Mgr.: H. M. Silver

SNAP-TITE, INC.
201 Titusville Rd., Union City, Pa. (Tel. 497)
V. P.-Purch.: Myron W. Shafer
V. P.-Sales: Leonard M. Clark
PS, GS, GH

M. L. SNYDER & SON, INC.
1834 E. Boston Ave., Philadelphia 24, Pa. (Tel. RE 9-5678)
Exec. V. P.: Herbert M. Simpson
Sales: George R. Slowey

SODERBERG MFG. CO., INC.
628 S. Palm Ave., Alhambra, Calif. (Tel. CUmberland 3-3382)
Purch. Agent: W. G. Lee
Sales Mgr.: W. W. Hulke
MF, GS, GH, TS, TR

SOHL CO., THE
1636 W. Hunting Park Ave., Philadelphia 40, Pa. (Tel. DAvenport 4-6800)
Purch. Agent: Sidney Whitman
Sales: John F. Sohl
MF, WN, PS, GS, GE, CO, TS, TR

SOLAR AIRCRAFT CO.
2200 Pacific Hwy., San Diego 12, Calif. (Tel. BElmont 3-8241)
Mgr.-Purch.: Russell L. Stevens
Buyer Suprvsrs.: P. G. Peninger & C. E. Powers
Dir.-Sales: C. D. Oberg

SOLON FOUNDRY, INC.
6370 SOM Ctr. Rd., Solon, O. (Tel. CHurchill 8-5304)
Purch. Agent: H. A. Lucas
Dir.-Sales: Harry F. Davis MF, PS

SONEX, INC.
73 S. State Rd., Upper Darby, Pa. (Tel. FLanders 2-1721)
Purch.: Ted Londner GH, GE, TS

L. SONNEBORN & SONS, INC., BUILDING PRODUCTS DIV.
404 4th Ave., New York 16, N. Y. (Tel. MUrray Hill 9-5210)
Adv. Dept.: Gabe Cipollo
MF, WN, PS, GS, GH, GE

SORENSEN & CO., INC.
Richards Ave., S. Norwalk, Conn. (Tel. TEmple 8-6571)
Purch. Mgr.: C. W. Boylan
Chief Purch. Agent: N. Grasso
Purch. Agents: H. Damsky & M. J. Ruddock
Sales Mgr.: H. T. Lowell

SOROBAN ENGRG., INC.
Box 1717, Melbourne, Fla. (Tel. 2525)
Purch. Agent: Robert Freile
GE, CO, TS, TR

SOUND APPARATUS CO.
Morris St., Stirling, N. J. (Tel. MIllington 7-0600)
Purch.: H. Niemann TS

SOUTH RIVER METAL PRODUCTS CO., INC.
377 Turnpike, S. River, N. J. (Tel. CLifford 4-5253)
Gen. Mgr.: J. Cohn
Sales Mgr.: Martin L. Roth
MF, WN, PS, GH

SOUTH WIND DIV., STEWART WARNER CORP.
1514 Drover St., Indianapolis, Ind. (Tel. MElrose 2-8411)
Dir.-Purch.: Paul Ostler
Purch. Agent: George Leiendecker
Buyer: Sam Salatich
Prod. Mgr.: D. A. Potter
MF, PS, GS, TR

SOUTHCO DIV., SOUTH CHESTER CORP.
Lester, Pa. (Tel. LEhigh 4-8600)
Purch. Agent: C. R. Hirzel
Gen. Mgr.-Sales: T. R. Dunlevy MF

SOUTHERN ELECTRONICS CORP.
150 W. Cypress Ave., Burbank, Calif. (Tel. VIctoria 9-3193)
Purch. Agent: R. D. Hirst
Sales Mgr.: George E. Gansell
GE, TS, TR

SOUTHWEST PRODUCTS CO.
1705 S. Mountain Ave., Monrovia, Calif. (Tel. EL 8-0181)
MF, WN, PS, GS, GH, GE

SOUTHWEST PRODUCTS, INC.
Rt. 4, Box 90, San Antonio, Tex. (Tel. GEneral 2-5266)
Purch. Agent: Robert Callsen CO, TS

SOUTHWESTERN INDUSTRIAL ELECTRONICS CO.
2831 Post Oak Rd., Box 13058, Houston 19, Tex. (Tel. MO 7-6611)
Purch. Agent: T. C. Wooddell
Buyer-Electronic: G. Knower
Buyer-Mechanical & Misc.: C. Brock
V. P.-Sales: R. H. Parker
MF, PS, GS, GH, GE, CO, TS, TR

SOUTHWESTERN INDUSTRIES, INC.
5880 Centinela Ave., Los Angeles 45, Calif. (Tel. ORegon 8-8915)
Purch. Agent: Dean F. Dirkson GE

SPACEFLIGHT FILMS, ALEX HABERSTROH STUDIOS, INC.
9 W. 19th St., New York 11, N. Y. (Tel. AL 5-1827)
Purch.: Alex Haberstroh

SPARTA MFG. CO.
Dover, O. (Tel. DOver 4-2380)
Plant Mgr.: C. M. Starkey
Sales Mgr.: Myron L. Bailey
MF, WN, PS, GE, TR

SPARTAN MARKING CORP.
222 W. Huron St., Chicago 10, Ill. (Tel. SUperior 7-6630)
Sales Mgr.: J. V. Galloway
MF, WN, PS, GS, GE, CO, TS, TR

SPARTON CORP.
2400 E. Ganson St., Jackson, Mich. (Tel. STate 4-9131)
Dir.-Purch.: A. G. Lee
Buyer: H. B. Scott
Dir.-Sales: John Newman
MF, WN, GS, GE, CO, TR

SPAULDING FIBRE CO., INC.
310 Wheeler St., Tonawanda, N. Y. (Tel. JAckson 2000)
Purch. Agent: A. P. Hardleben
Gen. Sales Mgr.: W. R. Gilsdorf
MF, WN, PS, GE, TR

SPECIALTIES, INC.
Skunks Misery Rd., Syosset, N. Y. (Tel. WAlnut 1-2345)
Purch. Agent: George Chadwick
V. P.-Sales: John C. Slocum
GE, TS, TR

SPECIALTIES MFG. CO., INC.
125 Bruce Ave., Stratford, Conn. (Tel. EDison 7-4429)
Purch. Agent: J. J. Zimmer
Sales Mgr.: A. I. Zimmer

SPECIALTY PRODUCTS CORP.
29980 Lakeland Blvd., Wickliffe, O. (Tel. WHitney 3-3040)
Purch. Agent: Howard Seabeck
MF, PS, GS, GH

SPECIFIC PRODUCTS
21051 Costanso St., Woodland Hills, Calif. (Tel. DIamond 0-3131)
Purch.: John Cowley & Bill Stork
Sales: J. C. Van Groos
GE, CO, TS, TR

SPECTROL ELECTRONICS DIV., CARRIER CORP.
1704 S. Del Mar Ave., San Gabriel, Calif. (Tel. ATlantic 7-9761)
Purch. Agent: John Hayek
Sales Mgr.: Robert K. Burtner
GE, CO, TS, TR

SPECTRUM INSTRUMENTS, INC.
Box 61 Steinway Sta., Long Island City 3, N. Y. (Tel. AStoria 8-8033)
Secy.-Treas.: I. M. Wempen
GS, GE, CO, TS, TR

SPENCER THERMOSTAT DIV.-METALS & CONTROLS CORP.
34 Forest St., Attleboro, Mass. (Tel. ATtleboro 1-2800)
Purch. Agent: E. B. Carpenter
V. P.-Sales: J. F. Wilson PS, GE

SPERRY GYROSCOPE CO., DIV.-SPERRY RAND CORP.
Great Neck, N. Y. (Tel. Fieldstone 7-3600)
Purch.: Aeronautical Equip. Div., F. Baron
Marine Div., L. F. Wichser
Air Armament Div., W. F. Batten
Surface Armament Div., C. J. Brown
MF, WN, PS, GS, GE, CO, TS, TR

SPERRY RAND CORP.
30 Rockefeller Plaza, New York 20, N. Y. (Tel. CIrcle 6-4800)

SPINCRAFT, INC.
4158-C W. State St., Milwaukee 8, Wisc. (Tel. DIvision 2-0730)
Purch. Agent: Tony Brinovec
Dir.-Mktg.: Charles F. Pearson
MF, WN, PS, GE, TR

SPLIT BALLBEARING, DIV.-MPB
Lebanon, N. H. (Tel. 800)
Purch. Agent: R. E. Tinkham
Sales Mgr.: A. J. Renz PS, GE

SPRAGUE ENGRG. CORP.
19300 S. Vermont Ave., Gardena, Calif. (Tel. DAvis 4-6677)
Purch. Agent: George J. Carr
Sales Mgr.: John W. Murvin
WN, PS, GE, TS

SPRAYING SYSTEMS CO.
3250 Randolph St., Bellwood, Ill. (Tel. LInden 4-0380)
Dir.-Purch.: A. Ciesel
Sales Mgr.: Joseph Pelej PS

SPRINGFIELD BRASS CO.
821-827 W. Main St., Springfield, O. (Tel. FAirfax 2-2291) MF, WN, PS, GE

R. SPRUCE CO.,
An Affiliate of American Aviation Publications, Inc., 608 S. Dearborn St., Chicago 5, Ill. (Tel. WAbash 2-1279)
Mgrs.: Robert E. Tynan & Paul W. Higgins
TP

SPRUCE PINE MICA CO.
P. O. Box 456, Spruce Pine, N. C. (Tel. POplar 5-4241)
Sales: E. H. Farnam PS, GE, TR

★STAINLESS PROCESSING DIV., WALL COLMONOY CORP.
19345 John R. St., Detroit 3, Mich. (Tel. TWinbrook 3-3800)
Sales Mgr.: Fred R. Cruse
MF, WN, PS
★(See advertisement in this issue)

STAINLESS STEEL PRODUCTS, INC.
2980 N. San Fernando Blvd., Burbank, Calif. (Tel. VI 9-3283)
Purch. Agent: F. C. Harmon
Contract Admin.: Wm. Van Den Akker
MF, PS, GS, GH, GE

★STALKER DEVELOPMENT CO.
903 Woodside Ave., Essexville, Mich. (Tel. Bay City—TWinbrook 3-7562)
Buyer: R. A. Bluhm
Sales Mgr.: W. W. Dempsey PS
★(See advertisement in this issue)

STANAT MFG. CO., INC.
515 Shames Dr., Westbury, L. I., N. Y. (Tel. EDgewood 4-8700)
Purch. Agent: John Vanderwoude
MF, WN, PS, GS

STANCIL-HOFFMAN CORP., THE
921 N. Highland Ave., Hollywood 38, Calif. (Tel. HOllywood 4-7461)
Purch. Agent: J. V. Kelly
Sales Mgr.: R. H. Stensby GE, TS, TR

STANDARD ARMAMENT INC.
631 Allen Ave., Glendale, Calif. (Tel. VIctoria 9-1314)
Purch.: Ronald Parish
Sales Mgr.: William McKinley
MF, WN, PS, GS, GH

STANDARD CABINET CO.
61 Washington Ave., Carlstadt, N. J. (Tel. GEneva 8-1500)
Purch. & Sales: Elwell S. Brown GS, TS

STANDARD ELECTROMAGNETICS, INC.
43-45 S. Carroll St., Frederick, Md. (Tel. MOnument 3-4161)
V. P.-Sales: A. H. Fogelman, Washington, D. C. (Tel. STerling 3-6770) GE, TS, TR

STANDARD ELECTRONICS DIV., RADIO ENGRG. LABS. INC.
29-01 Borden Ave., Long Island City, N. Y. (Tel. STillwell 6-2100)
Purch. Agent: Wm. Dunwe
V. P.-Sales: Wm. H. Zillger

STANDARD FELT CO.
29-115 S. Palm Ave., Alhambra, Calif. (Tel. ATlantic 2-5106)
Purch. Agent: K. Brunk MF, PS

STANDARD LOCKNUT & LOCKWASHER INC.
2250-56 Valley Ave., Indianapolis, Ind. (Tel. ME 2-9505)
Office Mgr.: R. E. Khmage
V. P.-Sales: T. D. Donahue MF, WN, PS

STANDARD METALS CORP.
262 Broad St., N. Attleboro, Mass. (Tel. MYrtle 5-9395)
Purch.: Lloyd W. Chase, Jr.
Sales: Donald Kingman
MF, WN, PS, GS, GE, TS, TR

STANDARD PRESSED STEEL CO.
Box 1105, Jenkintown, Pa. (Tel. TUrner 4-7300)
Purch. Agent: J. P. Moorhouse
Mgr.-Aircraft/Missile Div.: J. P. Villo
MF, PS, GS, GH

STANLEY AVIATION CORP.
2501 Dallas St., Denver 8, Colo. (Tel. EMpire 6-3581)
Purch. Agent: Carr Besermann
Buyers: R. O. Taylor & Lawrence Mack
V. P.-Sales: R. H. Frost
MF, WN, PS, GS, GH, CO, TS, TR

STANLEY MFG. DIV., GAGE ENGRG. CORP.
Saltsburg, Pa.
F. H. Hunter

WILLIAM W. STANLEY CO. INC.
401 Broadway, New York, N. Y. (Tel. CA 6-5420)
V. P.-Purch.: A. R. Peer
Treas.: S. H. Doggett, Jr.

STAR ENGRAVING CO., LTD.
223 E. 4th St., Los Angeles 13, Calif. (Tel. MAdison 9-1682)
Purch. Agent: Bud Hillyer
Sales: Al Butterworth
MF, WN, GS, GH, GE, CO, TS, TR

STAR EXPANSION PRODUCTS
P. O. Box 737, New York 8, N. Y. (Tel. COrtland 7-0069)
Sales: H. J. Wilhelm TS

L. S. STARRETT CO., THE
121 Crescent St., Athol, Mass. (Tel. CHurchill 9-3551)
Purch. Agent: C. B. McMillan
V. P.-Chg. Sales: C. O. Newton GS

STATIKIL, INC., DIV.-THE J. E. DOYLE CO.
1220 W. 6th St., Cleveland 13, O. (Tel. CHerry 1-3939)
V. P.-Purch.: Donald J. Doyle GS, TR

STAVER CO., INC., THE
47 N. Saxon Ave., Bay Shore, N. Y. (Tel. 7-3620)
Secy.: R. W. Collins
V. P.: J. B. Lazarus
MF, WN, PS, GS, GE, CO, TS, TR

STAVID ENGRG., INC.
Rt. 22, Plainfield, N. J. (Tel. PLainfield 7-1600)
Purch. Agent: J. H. Tchorni
Buyer-Components: L. J. Jannuzzi
Buyer-Raw Materials: R. J. Mills
Buyer-Operating & Maintenance: W. R. Linke
Buyer-Fabricated Parts: J. L. Symons
V. P.-Sales: Frank J. Reynolds
GE, CO, TS, TR

CODING

Missile Frame	**MF**
Warhead & Nose Cone	**WN**
Propulsion System	**PS**
Ground Support	**GS**
Ground Handling	**GH**
Guidance Equipment	**GE**
Check-out Equipment	**CO**
Test Equipment	**TS**
Tracking & Telemetering	**TR**
Research & Development	**RE**
Technical Publisher	**TP**

STEARNS-ROGER MFG. CO.
660 Bannock St., Denver 4, Colo. (Tel. AComa 2-8484)
Chief Purch. Engr.: R. W. Graeber
Asst. Chief Purch. Engr.: J. G. Constantine
Purch. Engrs.: Dan Ormsbee & J. L. Mitchell
V. P.-Sales Mgr.: M. G. Brennan
PS, GS, GH, TS

STEEL CITY TESTING MACHINES, INC.
8817 Lyndon Ave., Detroit, Mich. (Tel. WEbster 3-3500)
Purch. Agent: Patrick Duthie

HERMAN D. STEEL CO.
Lafayette Bldg., Philadelphia 6, Pa. (Tel. WA 5-1990)
Head-Purch. Dept.: P. N. Steel, Jr.
Head-Sales: W. W. Woolford
MF, WN, PS, GS, GE

STEEL IMPROVEMENT & FORGE CO., THE
970 E. 64th St., Cleveland 3, O. (Tel. UTah 1-8600)
Head-Purch.: Ford Parkes
Purch.: Henry Carlson
V. P.-Sales: H. A. Zimmerman
MF, WN, PS

STEIN SEAL CO.
20th St. & Indiana Ave., Philadelphia 32, Pa. (Tel. BAldwin 3-3513)
Asst. Gen. Mgr.-Purch.: Lawrence Goldschmidt
Gen. Mgr.-Sales: P. C. Stein
PS

WM. STEINEN MFG. CO.
43 Bruen St., Newark 5, N. J. (Tel. MArket 2-5747)
Sales: Charles H. Jung, Jr.
MF, WN, PS

STERLING TRANSFORMER CORP.
297 N. 7th St., Brooklyn 11, N. Y. (Tel. STagg 2-4200)
Purch. Agent: Coleman Sanders
GS, GE, TS, TR

A. T. STEVENS CO.
118 E. 28th St., New York 16, N. Y. (Tel. MUrray Hill 5-1877)
Purch. Agent: R. Duke Powell, Jr.
MF, WN, PS, GS, CO, TS

★STEVENS MFG. CO., INC.
P. O. Box 1007, Mansfield, O. (Tel. TUxedo 4-1311)
Purch. Agent: L. C. Frasher
Sales Mgr.: G. H. Rouse
PS, GS, GE, TS
★(See advertisement in this issue)

STEVENS PRODUCTS, INC.
86 Main St., E. Orange, N. J. (Tel. OR 2-2140)
V. P.: Ross S. Stevens
WN, PS, GS, GE, TR

STEVENS WALDEN INC.
400 Shrewsbury St., Worcester, Mass. (Tel. SWift 9-4111)
V. P.: E. F. Hennessey
MF, GS, GH, TS

STEVENS-ARNOLD INC.
7 Elkins St., S. Boston 27, Mass. (Tel. ANdrew 8-1170)
GS, GE, TS

D. M. STEWARD MFG. CO.
E. 36th St., P. O. Box 510, Chattanooga, Tenn. (Tel. TAylor 1-1561)
Dir.-Purch.: S. P. Gould
Exec. V. P.-Sales: Clarence S. Mills
MF, WN, PS, GS, GE, TR

★F. W. STEWART CORP.
4311-13 N. Ravenswood Ave., Chicago 13, Ill.
Gen. Mgr.: J. H. Jacobsen
Purch. Agent: G. O. Talley
Sales Mgr.: R. A. Thies
PS
★(See advertisement in this issue)

STEWART-WARNER CORP.
1826 Diversey Pkwy., Chicago, Ill. (Tel. LAkeview 5-6000)
Dir.-Purch., Stewart-Warner Corp., 1826 Pkwy., Chicago 14, Ill.: E. N. Osterberg
Dir.-Purch., Stewart-Warner Electronics, 1300 N. Kostner Ave., Chicago, Ill.: I. Blackberg (Tel. AL 2-1000)
Purch. Agent, Stewart-Die Casting Co., 4535 Fullerton Ave., Chicago, Ill.: R. C. Olsen (Tel. AL 2-5308)
Purch. Agent, Stewart-Warner Corp., 1514 Drover, Indianapolis, Ind.: P. Ostler
Purch. Agent, The Bassick Co., Bridgeport, Conn.: G. Raiselis
MF, WN, PS, GS, GE, TS, TR

STODDART AIRCRAFT RADIO CO., INC.
6644 Santa Monica Blvd., Hollywood 38, Calif. (Tel. HOllywood 4-9292)
Mgr.-Materials: Glenn Fogg
Purch. Agent: J. Hanrahan
Sales Mgr.: John R. Stevenson
GE, TS

F. J. STOKES CORP.
5500 Tabor Rd., Philadelphia, Pa. (Tel. CUmberland 9-0100)
Mgr.-Materials & Prod. Planning Dept.: W. T. Minnick
Buyers: D. Law, C. Roney, W. Schmucker & F. Urban
V. P.-Sales: A. A. Hutchings
PS, GS, GH

A. U. STONE & CO., INC.
17 W. 60th St., New York, N. Y. (Tel. COlumbus 5-1350)
Purch. Agent: H. Grant
MF, WN, PS, GS

STRATA INSTRUMENT CO.
323 Snyder Ave., Berkeley Hts., N. J. (Tel. CRest View 3-6231)
Purch. Agent: H. L. Harris
Chief Engr.-Sales: F. Streuber
WN, GS, GE, CO, TS

STRATOFLEX, INC.
P. O. Box 10398, Ft. Worth, Tex. (Tel. PEnhurst 8-6543)
PS, GS

STRATOS, DIV.-FAIRCHILD ENGINE & AIRPLANE CORP.
Orinoco Dr., Bay Shore, L. I., N. Y. (Tel. MOhawk 5-0100)
Purch. Agent: John A. L'Hommedieu
Gen. Sales Mgr.-Aviation Prods.: W. Thomas Stark
WN, PS, GS, GH

STRAT-O-SEAL MFG. CO.
3039 W. Fullerton, Chicago 47, Ill. (Tel. HUmboldt 9-1282)
Plant Mgr.: Howard O. Walsh
GE, CO

STREETER-AMET CO.
Grayslake, Ill. (Tel. BAldwin 3-4801)
Purch. Agent: M. Danielson
Sales Mgr.: G. Graham
TS, TR

STROMBERG-CARLSON, ELECTRONICS DIV.
1400 N. Goodman St., Rochester 3, N. Y. (Tel. FIllmore 2-8000)
Purch. Agent: M. G. Agan
Sales Mgr.-Military Prods.: H. C. Sager
WN, GS, GH, GE, CO, TS, TR

P. A. STURTEVANT CO.
Addison, Ill. (Tel. ELmhurst, Ill.-TErrace 4-2000)
Purch. Agent: Joe Esposito
Sales Mgr.: Lee A. Sturtevant
TS

SUFFOLK PRODUCTS CORP.
Woodbine & Scudder Aves., Northport, N. Y. (Tel. NOrthport 3-1700)
Head-Purch. Dept.: Fred. Marin
Sales Engr.: C. J. Dvorak
MF, TR

SUN ELECTRIC CORP., AERONAUTICAL DIV.
Harlem & Avondales Aves., Chicago 31, Ill. (Tel. NEwcastle 1-6000)
Dir.-Purch.: R. E. Kane
V. P. & Gen. Mgr.: F. E. Draper

SUNDSTRAND AVIATION, DIV.-SUNDSTRAND MACHINE TOOL CO.
2421 11th St., Rockford, Ill. (Tel. 8-6811)
Dir.-Prod. & Purch.: Quin Bowen
Purch. Mgr.: Don Bredahl
Contracts Mgr.: P. A. Anderson
MF, PS, GS, GH, GE

SUNDSTRAND TURBO
2480 W. 70th Ave., Denver 21, Colo. (Tel. HA 9-1561); Pacoima, Calif. (Tel. EM 6-8121)
Mgr.-Purch., Denver: William Hammond
Sr. Buyer, Denver: Lou Harder
Purch. Agent, Pacoima: Robert Meyerson
Mgr.-Sales, Pacoima: Robert Holzl
Chief Appl. Engr., Denver: R. Bruce Foster
MF, WN, PS, GS, GH, GE

SUPEREX ELECTRONICS CORP.
4-12 Radford Pl., Yonkers, N. Y. (Tel. YOnkers 5-6906)
Purch. Agent: D. Schulman
Asst. Purch. Agent: F. Gold
Sales Mgr.: Marvin L. Buchalter
MF, PS, GS, GH, GE, TR

SUPERIOR AIR PRODUCTS CO.
132 Malvern St., Newark 5, N. J. (Tel. MArket 3-1335)
Chief Engr.: L. E. Putman
PS, GS, GH

SUPERIOR CARBON PRODUCTS, INC.
9115 George Ave., Cleveland 5, O. (Tel. VUlcan 3-4880)
Purch. Agent: Raymond H. Kling
Sales Mgr.: Ted Liebert
MF, WN, PS, GS, GE, TR

SUPERIOR ELECTRIC CO., THE
83 Laurel St., Bristol, Conn. (Tel. LUdlow 2-9561)
Adv. Dept.: Frank A. Leachman
GS, GE, CO, TS, TR

SUPERIOR FLUX & MFG. CO., THE
1536 St. Clair Ave., Cleveland 14, O. (Tel. SUperior 1-9373)
Pres.: Robert R. Mendelson
MF

SUPERIOR PNEUMATIC & MFG., INC.
4758 Warner Rd., Cleveland 25, O. (Tel. BRoadway 1-1522)
Gen. Mgr.: W. I. Krewson, Jr.
Sales Mgr.: Robert H. Wright
GS, GH

SUPERIOR SPINNING & STAMPING CO.
4057-63 Fitch Rd., Toledo 13, O. (Tel. GReenwood 2-2175)
Purch. Agent: Leonard G. Avery
MF, WN, PS, GS

SUPERIOR TUBE CO.
Box 191, Norristown, Pa. (Tel. BRoadway 2-5070)
Dir.-Purch.: Elmer W. Hayes
Purch. Agent: Leroy Buckwalter
Buyers: Ralph Esser, Stanley Fretz & William Schlutz
Gen. Mgr.-Sales: Henry B. Brown
MF, PS, GE, TS, TR

SURPRENANT MFG. CO.
172 Sterling St., Clinton, Mass. (Tel. 2180)
Gen. Mgr.: G. E. Forsberg
Sales: P. V. Tessier
MF, WN, PS, GS, GH, GE, TS, TR

SWEDLOW PLASTICS CO.
6986 Bandini Blvd., Los Angeles 22, Calif. (Tel. RAymond 3-3211)
Mgr.-Purch.: R. H. Affeld
Dir.-Contracts: W. H. Face
Mgr.-Western Contracts Sec.: R. H. Malamphy
Suprvsr.-Western Contracts Sec.: C. M. Phinny
MF, WN, PS, GH, GE, TR

H. C. SWEET CO.
56861 Grand River Ave., New Hudson, Mich. (Tel. GEneva 7-9391)
Secy.-Purch.: G. M. Savage
Sales: Harold C. Sweet GS

SWISS JEWEL CO.
Lafayette Bldg., Philadelphia 6, Pa. (Tel. WA 5-1990)
Purch.: P. N. Steel, Jr.
Sales: W. W. Woolford PS, GE, TR

SWITCHCRAFT, INC.
5555 N. Elston Ave., Chicago, Ill. (Tel. SPring 4-1515)
Purch.: Bjorn Hestad
Sales: W. L. Larson GS, GE, TS, TR

SYLVANIA ELECTRIC PRODUCTS INC., PARTS DIV.
12 2nd St., Warren, Pa. (Tel. 3220)
Div. Purch. Agent: Robert F. Marlin
Buyer-Metals: M. D. Svensen
Buyer-Packing Materials: J. C. Douds
Buyer-Electr. Supp.: H. E. Fogle
Buyer-Plastic Materials: C. F. Warriner
Buyer-Mill Supp.: C. W. Proud, Jr.
Div. Gen. Sales Mgr.: Philip M. Pritchard
MF, WN, PS, GS, GE, TS, TR

SYLVANIA ELECTRONIC SYSTEMS, DIV.-SYLVANIA ELECTRIC PRODUCTS INC.
100 1st Ave., Waltham, Mass. (Tel. TWinbrook 3-9200)
Purch. Agent-Waltham Labs.: W. L. Hanson
Purch. Agent-Buffalo Opns.: C. A. Rae (Tel. Buffalo, N. Y.-VIctoria 7100)
Purch. Agent-Williamsport Systems Plant: D. E. O'Shea (Tel. Williamsport, Pa.-WIlliamsport 3-4641)
Purch. Agent-Mountain View Opns.: W. A. Janes (Tel. Mountain View, Calif.-YOrkshire 8-0051)
Dir.-Customer Relations, Sylvania Electronic Systems: J. H. Brewster, III (Tel. New York, N. Y.-JUdson 6-2424)
MF, GS, GE, GH, TS, TR

SYNTHANE CORP.
River Rd., Oaks, Pa. (Tel. GLendale 2-2211)
Purch. Agent: C. H. Cox, Jr.
Sales Mgr.: E. E. Smith
MF, WN, PS, GS, GE, TR

SYNTRON CO.
859 Lexington Ave., Homer City, Pa. (Tel. Homer City 9-8011)
Purch. Agent: S. A. Dick
V. P.-Sales: D. G. Black
MF, WN, PS, GS, GH, GE, TR

SYSTEMS LABS. CORP.
14852 Ventura Blvd., Sherman Oaks, Calif. (Tel. STate 6-2238)
Exec. V. P.: Richard H. DeLano

SYSTRON CORP.
2055 Concord Blvd., Concord, Calif.
Sales Mgr.: J. R. Cunningham
PS, GS, GH, GE, CO, TS, TR

TA MFG. CORP.
4607 Alger St., Los Angeles 39, Calif. (Tel. CHapman 5-3748)
Purch. Agent: R. E. Felton
V. P.-Sales: R. Clyde Jordan
MF, WN, PS, GS, GE, CO, TS, TR

T-C DIV., DYNA-EMPIRE, INC.
1075 Stewart Ave., Garden City, L. I., N. Y. (Tel. Pioneer 1-2700)
Purch. Agent: Charles Biasi
Sales: John J. Nargi PS, GS, CO, TS

TKM ELECTRIC CORP.
1160 University Ave., Rochester 7, N. Y. (Tel. BRowning 1-4671)
Purch. Agent: R. A. Taylor

TACTAIR VALVE DIV.-AIRCRAFT PRODUCTS CO.
400 Church Rd., Bridgeport, Pa. (Tel. BRoadway 5-1000)
Purch. Agent: T. M. Clemmency
Sales Mgr.: Frank Higgins
MF, WN, PS, GS, GH, GE

TALCO ENGRG. CO., THE
2685 State St., Hamden, Conn. (Tel. ATwater 8-1634)
Purch. Agent: F. DeMarco
Buyer: D. Pantera
Dir.-Sales: A. E. Ehlenberger
MF, WN, PS, GS, GH, GE

TALK-A-PHONE CO.
1512 S. Pulaski Rd., Chicago 23, Ill. (Tel. LAwndale 1-8414)
Sales Mgr.: Dan F. Kagan GS

TALLEY CORP., THE
101 Highway & Conejo Rd., Newbury Park, Calif. (Tel. THousand Oaks 2025)
Purch. Agent: Meade Davis
V. P.-Sales: Norman Nicholson
MF, WN, PS, GS, GE, CO, TS, TR

TALLY REGISTER CORP.
5300 14th Ave., N. W., Seattle 7, Wash. (Tel. SUnset 4-5500)
Dir.-Purch.: W. A. Thompson
V. P.-Sales: M. R. Dilling TS, TR

TALON, INC.
626 Arch St., Meadville, Pa. (Tel. 41-281)
Mgr.-Purch.: F. V. Hanaway
Asst. Mgr.-Purch.: R. C. Straw
V. P.-Sales: R. M. Evans

TAPERED AIR PRODUCTS CORP.
10890 Stanford Ave., Lynwood, Calif. (Tel. NEvada 6-9851)
Purch. Agent: Walter Fagen
Sales Mgr.: James I. Carpenter
MF, PS

TASK CORP.
1009 E. Vermont Ave., Anaheim, Calif. (Tel. PRospect 4-3100)
Purch. Agent: Carl M. Berg
Sales Mgr.: Joe A. Fryer, Jr.
WN, PS, GS, GH, GE, TS, TR

TAURUS CORP. (FORMERLY METRON CORP.)
8 Coryell St., Lambertville, N. J. (Tel. EXport 7-1570)
Purch.: Mrs. Anne Row
Sales: John D. Kreuter MF, GS, GE, TR

TAYLOR-WINFIELD CORP., THE
1052 Mahoning Ave., N. W., Warren, Ohio (Tel. 2252-1)

TECHALLOY CO. INC.
Route 113, Rahns, Pa. (Tel. Norristown HUxley 9-7211)
Pres.: D. M. Schmid MF, WN, PS

TECHNICAL APPLIANCE CORP.
1 Taco Ave., Sherburne, N. Y. (Tel. 7-2211)
V. P.-Dir. of Purch.: Harold Senkel
V. P.-Dir. of Sales: Tore Lundahl
WN, PS, GS, GH, GE, CO, TS, TR

TECHNICAL OIL TOOL CORP.
1057 N. La Brea, Los Angeles 38, Calif. (Tel. OLdfield 4-1763)
Mgr.-Purch.: T. Bannerman

TECHNICAL SERVICE CORP.
1404 W. Market St., Louisville 3, Ky. (Tel. JUniper 7-8476)
Buyer: L. H. Jones GS

TECHNIQUES, INC.
52 Jackson Ave., Hackensack, N. J. (Tel. HUbbard 9-5333)
Buyer: B. Weston
Sales Mgr.: Al Neumann
MF, WN, PS, GS, GE, TS, TR

TECHNITROL ENGRG. CO.
1952 E. Allegheny Ave., Philadelphia 34, Pa. (Tel. GArfield 6-9105)
Purch. Agent: James H. Kennedy
Buyer: David Adam
Asst. Buyer: Jacqueline M. Mika
V. P.-Sales: T. Kite Sharpless
GS, GE, TS, TR

TECHNOGRAPH PRINTED ELECTRONICS, INC.
920 Northwest Blvd., Winston-Salem, N. C. (Tel. PArk 3-0767)
Purch. Agent: R. G. Vance TR

TECHRON CORP.
81 Washington St., Boston 8, Mass. (Tel. CApitol 7-7484)
Purch. Agent: Thomas Fahey GE

ROLAND TEINER CO. INC.
134 Tremont St., Everett, Mass. (Tel. DUnkirk 7-7800)
Purch.: R. Tenagilia
V. P.-Sales: K. Sowdon
MF, WN, PS, GS

TELECHROME MFG. CORP.
28 Ranick Dr., Amityville, N. Y. (Tel. LIncoln 1-3600)
Purch. Agent: B. Trimboli
V. P.-Sales: H. Charles Riker
PS, GS, GE

TELE-COIL CO.
2733 Saunders St., Camden 5, N. J. (Tel. EMerson 5-7528)
Secy.-Treas.: Jack Silverman
PS, GE, CO, TS, TR

TELECTRO INDUSTRIES CORP.
35-16 37th St., Long Island City, N. Y. (Tel. YEllowstone 2-8600)
Purch. Agent: M. I. Ross
Sales: David Libsohn

★TELE-DYNAMICS INC.
5000 Parkside Ave., Philadelphia 34, Pa. (Tel. TRinity 8-3000)
Purch. Agent: J. Harbidge
Buyers: W. Porch & F. Brandle
V. P.-Sales: L. P. Clark GE, TR
★(See advertisement in this issue)

TELEFLEX INC.
N. Wales, Pa. (Tel. OXbow 9-4861)
Purch. Agent: T. Walton
Chief Buyer: W. Taylor
Sales: M. C. C. Chisholm, Jr.
PS, GS, GH, GE, CO, TS, TR

★TELERAD MFG. CORP.
1440 Broadway, New York 18, N. Y. (Tel. BRyant 9-0892)
Purch. Agent: B. Buffone
Expediter: C. Young
Consultant & Negotiator: E. A. Kiely
Sales Mgr.: Charles George
PS, GS, GE, CO, TS, TR
★(See advertisement in this issue)

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

TELETRONICS LABS., INC.
1835 W. Rosecrans Ave., Gardena, Calif. (Tel. FAculty 1-0627)
Purch. Agent: Seymour Newman
V. P.-Sales: Daniel Rose
MF, GS, GH, GE, TR

TELETRONICS LABORATORY INC.
54 Kinkel St., Westbury, L. I., N. Y. (Tel. EDgewood 3-1027)
Purch. Mgr.: Art Zink
Sales Mgr.: Raymond L. Johnson
GS, TS, TR

TELEVISO CORP.
1415 Golf Rd., Des Plaines, Ill. (Tel. ROdney 3-8100)
Purch. Agent: M. E. Schneider
Sales Mgr.: D. F. Shea, Jr.
GS, GE, TR

TEL-INSTRUMENT ELECTRONICS CORP.
728 Garden St., Carlstadt, N. J. (Tel. WEbster 3-1600)
Purch. Agent: A. J. Paret
Sales Mgr.: E. W. Brinkerhoff
MF, PS, GS, GH, GE, CO, TS, TR

TELKOR, INC.
N. Murray Ridge Rd., Elyria, O. (Tel. FA 2-8623)
V. P.-Gen. Mgr.: Howard R. Roe
GS, GH, GE, TR

TEL-LABS., INC.
1050 Second St., Manchester, N. H. (Tel. NA 3-5711)
Gen. Mgr.: J. Henry Izart **GE, TS, TR**

TELONIC INDUSTRIES, INC.
75 N. 2nd Ave., Beech Grove, Ind. (Tel. STate 6-9239)
Buyer: Mrs. B. A. Wainwright
PS, GS, GE, CO, TS, TR

TEMCO AIRCRAFT CORP.
P. O. Box 6191, Dallas 22, Texas (Tel. BRoadway 6-7111)
Pres. & Gen. Mgr.: Robert McCulloch

TEMPIL CORP.
132 W. 22nd St., New York 11, N. Y. (Tel. ORegon 5-6610)
Purch.: Mimi Stoke
Order Suprvsr.: E. Lee **PS, GE, TS**

TEMPLETON, KENLY & CO.
16th & Gardner Rd., Broadview, Ill. (Tel. FIllmore 3-0880) **GS**

TEMPO INSTRUMENT INC.
240 Old Country Rd., Hicksville, N. Y. (Tel. OVerbrook 1-2280)
Purch. Agent & Sales Mgr.: F. Meyer
WN, GS, GE, CO, TR

M. TEN BOSCH, INC.
80 Wheeler Ave., Pleasantville, N. Y. (Tel. ROgers 9-3000)
Dir.-Prod.: G. P. Bierbach
Mgr.-Prod. App'n & Sales: Saul Padwo
MF, GS, GE, CO, TS, TR

G. H. TENNANT CO.
721 N. Lilac Dr., Minneapolis 22, Minn. (Tel. LI 5-3771)
Purch. Agent: Gilbert J. Kehr
Sales Mgr.: Joe Lyon

TENNEY ENGRG., INC.
1090 Springfield Rd., Union, N. J. (Tel. MUrdock 6-7870)
Also: 2235 Sisson St., Baltimore, Md.
Purch. Agent: Robert Hak
V. P.-Sales Mgr.: Robert H. Brown
GS, TS

TENSITRON, INC.
12-24 Harvard Depot Rd., Harvard, Mass. (Tel. GLadstone 6-3511)
Pres. & Gen. Mgr.: Dr. Erwin J. Saxl

TENSOR ELECTRIC DEVELOPMENT CO., INC.
1873 Eastern Pkwy., Brooklyn 33, N. Y. (Tel. HY 5-9200)
Purch. Agent: Mrs. P. McFarland
MF, PS, GS, GH, GE, TS, TR

TEPRO ELECTRIC CORP.
408A Burke Bldg., 5 St. Paul St., Rochester 4, N. Y. (Tel. BAker 5-0478)
Asst. Sales Mgr.: Mrs. Ruth V. Noblett

TERADO CO.
1068 Raymond Ave., St. Paul 14, Minn. (Tel. MIdway 6-2514)
Gen. Mgr.: D. G. Munson
Purch.: George Huff
Sales Mgr.: John J. Kaul **GS, GE**

TERMINAL RADIO CORP.
85 Cortlandt St., New York, N. Y. (Tel. WOrth 4-3311)
Purch. Agents: M. Blumberg, R. Corenthal & M. Filler
V. P.-Sales: Frank Miller
PS, GS, GH, GE, CO, TS, TR

GEORGE A. TERRY CO.
356 S. Elmwood Ave., Buffalo 1, N. Y. (Tel. WA 0633)
Mgr.: George A. Terry
Sales Mgr.: Harold A. Dodge

TEXAS CAPACITOR CO.
922 S. 75th St., Houston, Tex. (Tel. WA 3-9173)
Chief Engr.-Purch.: George S. Chaffin
Purch. Agent: Faye Harper
Gen. Mgr.-Sales: A. Koberling **GE**

TEXTRAN CORP.
P. O. Box 9207, 8500 Research Rd., Austin, Tex. (Tel. GL 3-8378)
Bus. Mgr.: George E. Strandtmann

THERMAL AMERICAN FUSED QUARTZ CO., INC.
18-20 Salem St., Dover, N. J. (Tel. FOxcroft 6-2807)
Purch. Agent: R. Doormann
Sales Mgr.: John F. von Sternberg
MF, PS

THERMAX WIRE CORP.
304 E. 45th St., New York 17, N. Y. (Tel. MUrray Hill 9-7120)
Purch. Agent: John D. Sheeran
Sales Mgr.: George W. Heller
MF, PS, GS, CO, TS, TR

THERM-ELECTRIC METERS CO., INC.
Hudson St., Ext., Ithaca, N. Y. (Tel. 4-9501)
V. P.: John E. Paige
Sales Engr.: H. A. Davis, Jr.
MF, PS, GS

THERMO ELECTRIC CO., INC.
109 5th St., Saddle Brook, N. J. (Tel. HUbbard 9-5800)
Purch. Agent: J. P. McKoon
Prod. Mgr.: A. Allee
Sales Mgr.: J. H. Collins
MF, PS, GS, GE, CO, TS, TR

THERMO KING CORP.
44 S. 12th St., Minneapolis 3, Minn. (Tel. FEderal 8-5871)
Exec. V. P.-Sales: M. B. Green **GE**

THERMO MATERIALS, INC.
4040 Campbell Ave., Menlo Park, Calif. (Tel. DAvenport 6-2780)
Purch. Agent: Don C. Rebok
Exec. V. P.-Sales: Emo D. Porro
MF, WN, PS, GE, TR

THERMOLAB CORP.
6940 Farmdale Ave., N. Hollywood, Calif. (Tel. STanley 7-7105)

THERMO-PANEL DIV., DEAN PRODUCTS INC.
616 Franklin Ave., Brooklyn 38, N. Y. (Tel. STerling 9-5400)

THETA INSTRUMENT CORP.
48 Pine St., E. Paterson, N. J. (Tel. SWarthmore 7-7700)
Purch. Agent: Ralph Rinaldi
Sales Mgr.: Stanley Handelman
GE, CO, TS, TR

THIEBLOT AIRCRAFT CO., DIV.-VITRO CORP. OF AMERICA
Martinsburg, W. Va. (Tel. AMherst 3-3385)
Dir.-Purch.: Art Williams
V. P.-Sales: W. P. Maloney
MF, WN, PS, GS, GH, GE, CO, TS, TR

THIOKOL CHEMICAL CORP., REDSTONE DIV.
Huntsville, Ala. (Tel. JE 6-4411)
Purch. Agent: F. L. Quinn
Purch.: Joe Todd & Russ Fowler

THOMAS INSTRUMENT CO.
41 Silver Rock, Phoenix, N. Y. (Tel. OWen 5-5134)
Prod. Mgr.: S. M. Thomas
Sales Mgr.: R. Roe **PS**

THOMAS & SKINNER, INC.
1120 E. 23rd St., Indianapolis, Ind. (Tel. WA 3-2448)
Purch. Agent: E. F. Waterman
GE, TS, TR

H. I. THOMPSON FIBER GLASS CO.
1733 Cordova St., Los Angeles 7, Calif. (Tel. REpublic 3-9161)
Purch. Agent: Dean Welch
Buyer: E. Titus
V. P.-Sales: W. E. Benke
MF, WN, PS, GS, TR

THOMPSON PRODUCTS, INC.
23555 Euclid Ave., Cleveland 17, O. (Tel. IVanhoe 1-7500)
Staff Dir.-Purch.: G. N. Hackett
V. P.-Sales: G. R. Moore

THOMPSON-BREMER & CO.
228 N. La Salle St., Chicago 1, Ill. (Tel. FRanklin 2-6858)
Sales Mgr.: Gail M. Rutledge
MF, PS

THOMPSON-RAMO-WOOLDRIDGE PRODUCTS CO., THE
P. O. Box 45067, Airport Station, Los Angeles 45, Calif. (Tel. OSborne 4-5601)
Controller: Robert J. Barrett, Jr.
Dir.-Mktg.: Raymond E. Jacobson
CO, TS, TR

ARTHUR TICKLE ENGRG. WORKS, INC.
21 Delevan St., Brooklyn 31, N. Y. (Tel. MAin 5-4200)
Purch. Agent: Andrew Posser
Buyers: William Doyle & Frank Petito
Industrial Sales Mgr.: Nicholas P. Harvey
MF, WN, PS

TIMES WIRE & CABLE CO., INC.
358 Hall Ave., Wallingford, Conn. (Tel. COlony 9-3381)
Office Mgr.-Purch.: Leo J. Balestrero
V. P.-Sales: Lawrence J. DeGeorge
MF, PS, GS, GH, TS, TR

TIMKEN ROLLER BEARING CO., THE
1835 Dueber Ave., S. W., Canton, O. (Tel. GL 3-4511)
Purch. Agent: Paul Young
V. P.-Sales: W. B. Moore
MF, PS, GH, GE

E. F. TIMME & SON, INC.
1 Park Ave., New York, N. Y. (Tel. MU 3-2580)
Mgr.-Industrial Div.: H. Arnold Giles
MF

TINGSTOL CO.
1461 W. Grand Ave., Chicago 22, Ill. (Tel. CAnal 6-1520)
Purch. Agent: L. R. Morton
Sales: John P. Zopp GE

TINNERMAN PRODUCTS, INC.
Dept. 16, P. O. Box 6688, Cleveland 1, O. (Tel. SHadyside 1-9300)
Dir.-Purch.: R. F. Merriam MF

TITAN METAL MFG. CO.
Bellefonte, Pa. (Tel. EL 5-4712)
V. P.-Purch.: M. J. Rothrock
Gen. Purch. Agent: B. R. Tingue
Tech. Asst. to Gen. Purch. Agent: R. H. Eiser
Purch. Agent-Raw Material: O. T. Lambert
V. P.-Sales: R. H. Lightner
MF, WN, PS, GE

TITANIUM METALS CORP. OF AMERICA
233 Broadway, New York 7, N. Y. (Tel. WOrth 4-7620)
Dir.-Mktg.: T. W. Lippert
Sales Mgr.: Robert S. Nycum MF, WN

TITEFLEX, INC.
Hendee St., Springfield, Mass. (Tel. REpublic 9-5631)
Purch. Dir.: S. J. Souis
Buyers: R. Brennan & R. Handel
Sales: D. H. Arthur
MF, PS, GS, GH, GE, CO, TS, TR

TODD PRODUCTS CO., INC.
156 Gramatan Ave., Mt. Vernon, N. Y. (Tel. FAirbanks 4-0223)
Purch. Agent: S. Fishman
Sales Mgr.: E. Martoccia GE

TOPFLIGHT CORP.
160 E. 9th Ave., York, Pa. (Tel. 8-1541)
Purch. Agent: C. N. Jordan
Sales Dir.: R. M. Dent MF, PS

TOPPER MFG. CO., INC.
147-12 Liberty Ave., Jamaica 35, N. Y. (Tel. AXtel 1-8390)
Sales Mgr.: Fred Greil
MF, WN, PS, GS, GH, GE, TR

TORIT MFG. CO.
Walnut & Exchange Sts., St. Paul, Minn. (Tel. CApital 2-4419)
Purch. Agent: George Huna
V. P.-Sales: Frank Chase

★C. W. TORNGREN CO., INC.
236 Pearl St., Somerville 45, Mass. (Tel. MOnument 6-3250)
Purch. Agent: Wm. DeCain
Head-Sales: Kenneth A. Casavant
MF, WN, PS, GS
★(See advertisement in this issue)

TORRINGTON CO., THE
59 Field St., Torrington, Conn. (Tel. HUnter 2-4441)
Dir.-Purch.: W. V. Viering
Sales Mgr.: R. G. O'Connell
MF, WN, PS, GS, GH, GE

TOWACO ELECTRONICS
Pine Brook Rd., Towaco, N. J. (Tel. DE 4-4443)
Pres.: Samuel I. Cory, Jr.

★TOWNSEND CO., CHERRY RIVET DIV.
1224 E. Delhi Rd., Santa Ana, Calif. (Tel. KI 5-5511)
Purch. Agent: S. H. Bates
Sales Mgr.: John H. Roy MF, WN, PS
★(See advertisement in this issue)

TRAID CORP.
17136 Ventura Blvd., Encino, Calif. (Tel. STanley 7-5373)
Purch. Agent: Anthony De Marco
Merchandising: Mark MacIntosh
CO, TS, TR

★TRAILMOBILE INC.
31st & Robson Sts., Cincinnati 9, O. (Tel. REdwood 1-2323)
Dir.-Purch.: Wm. H. French
V. P.-Sales: Harry Eyler MF, GS, GH
★(See advertisement in this issue)

TRANE CO., THE
2nd & Cameron Ave., La Crosse, Wisc. (Tel. 2-8000)
V. P.-Purch.: R. H. Pearse
Exec. V. P.-Sales: Thomas Hancock
MF, WN, PS, GS, GH, GE, TR

TRANS ELECTRONICS, INC.
7349 Canoga Ave., Canoga Park, Calif. (Tel. Diamond 0-3334)
Buyer: L. Keldrauk
V. P.-Sales: William J. Miller
PS, GS, GE, CO, TS, TR

TRANSCO PRODUCTS, INC.
12210 Nebraska Ave., Los Angeles 25, Calif. (Tel. BRadshaw 2-5687)
Purch.: Hugh P. Rice
Sales: E. M. Cleland

TRANSDYNE CORP.
5815 57th Drive, Maspeth 78, N. Y. (Tel. TW 4-6681)
Dir.-Purch.: E. Braun
GS, GE, CO, TS

TRANSFORMERS, INC.
200 Stage Rd., Vestal, N. Y. (Tel. ENdicott 8-3311)
Purch. Agent: L. Bronson
Sales Engr.: M. Shufler
GS, GE, CO, TS, TR

TRANSISTOR DEVICES INC.
730 Blvd., Kenilworth, N. J. (Tel. CHestnut 1-0044)
Purch.: Leon Kapelsohn

TRANSITRON ELECTRONIC CORP.
168 Albion St., Wakefield, Mass. (Tel. CRystal 9-4500)
Purch. Agent: George Johnstone
Sales Mgr.: James B. Hangstefer GE

TRANSONIC, INC.
808 16th St., Bakersfield, Calif. (Tel. FA 7-5701)
Dir.-Purch.: Harvey A. Lipp
Gen. Sales Mgr.: C. P. Cushway
GS, GE, TS, TR

TRANS-SONICS, INC.
P. O. Box 328, Lexington 73, Mass. (Tel. BRowning 2-1000)
Purch. Agent: Robert L. Maeder
Gen. Sales Mgr.: Howard A. Morrison, Jr.
CO, TS, TR

TRANSUE & WILLIAMS STEEL FORGING CORP.
1300 Ely, Alliance, O. (Tel. 1-5741)
Purch. Agent: H. C. Martin
Asst. Purch. Agent: R. H. Cost
Sales Mgr.-Stamping Div.: C. J. Brunn
Sales Mgr.-Forge Div.: J. W. Ament
MF, WN, PS

TRESCO, INC.
3824 Terrace St., Philadelphia 28, Pa. (Tel. IV 3-1383)
Purch. Agent: Stanley Fisher
Sales: Stan Auerbach
MF, PS, GS, GE, TS, TR

TRIAD TRANSFORMER CORP.
4055 Redwood Ave., Venice, Calif. (Tel. EXmont 7-2145)
Purch. Agent: G. L. Howard
Sales Mgr.: Ernest Clover GS, GE, TR

TRICON MFG. CO.
8008-12 S. Wallace St., Chicago 20, Ill. (Tel. ABerdeen 4-0600)
Purch.: William R. Grandle
Sales: T. R. Boedeker
MF, WN, PS, GE, TR

TRICRAFT PRODUCTS CORP.
1124 W. Newport Ave., Chicago 13, Ill. (Tel. WEllington 5-5383)
Gen. Mgr.: E. A. Goncoe
GS, GH, GE, TS, TR

TRI-DEX CO.
P. O. Box 1207, Lindsay, Calif. (Tel. LIndsay 2-4051)
K. B. Howard
MF, WN, PS, GS, GH, GE, CO, TS, TR

TRIMOUNT INSTRUMENT CO.
3119 W. Lake St., Chicago 12, Ill. (Tel. NEvada 2-3747)
Purch.: F. R. Areni
Sales Mgr.: D. E. Haines
MF, WN, PS, GE, CO, TS

TRINDL PRODUCTS, LTD.
1807 S. Clark St., Chicago 16, Ill. (Tel. VIctory 2-7716)
Gen. Mgr.: Joseph H. Trindl, Jr.
PS, GS

TRIO CHEMICAL WORKS, INC.
341 Scholes St., Brooklyn 6, N. Y. (Tel. HYacinth 7-3595)
Purch.: Harold Blank
Sales: M. M. Blank
MF, WN, PS, GS, GH

TRIO LABORATORIES, INC.
4025 Merrick Rd., Seaford, N. Y. (Tel. SUnset 5-5030)
Purch. Agent: Thomas Curry
Sales Mgr.: Jay S. Salz
GE, CO, TS, TR

TRION, INC.
1000 Island Ave., McKees Rocks, Pa. (Tel. FEderal 1-3300)
Purch. Agent: John L. Hergenroeder

TRI-POINT PLASTICS INC.
175 I. U. Willets Rd., Albertson, L. I., N. Y. (Tel. MAyfair 1-5800)
Purch. Agent: Sid Kipnes
Buyer: Sal Mulay
Dir.-Sales: Pat Ruggieri
MF, WN, GE, TR

TROP-ARCTIC, INC.
3000 S. Hackley St., Muncie, Ind. (Tel. ATlas 2-4582)
Sales Mgr.: A. M. Andrews GS

TRUE ALLOYS INC.
284 S. Summit St., Detroit 9, Mich. (Tel. VInewood 2-8686)
Secy.: F. C. Huft MF, WN, PS, GE

TRUXTON INDUSTRIES, INC.
P. O. Box 46, Rose Hill, Kans. (Tel. 54)
Purch. Agent: Norma Lyster
V. P.-Sales: Ted Jerson
MF, WN, PS, GS, GE

CODING

Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

TUBE DISTRIBUTORS CO., INC.
1415 Kellum Place, Garden City, N. Y. (Tel. PIoneer 7-5000)
Sr. Buyer: Albert Salis
Sales Mgr.: David Reeves

TUBE METHODS INC.
Depot & Rambo Sts., Bridgeport, Montg. Co., Pa. (Tel. Norristown-BR 5-6125)
Exec. V. P.: Paul V. Fly
MF, PS, GE, TS, TR

TUBE REDUCING CORP.
520 Main Ave., Wallington, N. J. (Tel. PRescott 7-3700)
Purch. Agent: E. P. McMahon
Gen. Sales Mgr.: C. L. Megargle
MF, WN, PS

TUCSON INSTRUMENT CORP.
1050 E. Valencia Rd., P. O. Box 11247, Tucson 2, Ariz. (Tel. MAin 2-1092)
Pres.: Frank R. Pener
MF, WN, PS, GS, GH, GE, CO, TS, TR

TURBO DYNAMICS CORP.
Douglas-Tahoe Airport, Minden, Nev. (Tel. 52311)
Asst. Secy.-Purch.: Wilfred Jones
Asst. Purch. Agent: Fred H. Thaheld
MF, PS, GS, GH, GE

TUR-BO JET PRODUCTS CO., INC.
424 S. San Gabriel Blvd., San Gabriel, Calif. (Tel. CUmberland 3-5191)
Purch. Agent: C. A. Sprowl
PS, GE, CO, TR

TURBO PRODUCTS, INC.
12177 Montague St., Pacoima, Calif. (Tel. EMpire 9-5252)
Purch. Agent: Howard Wade
Sales Co-Ordinator: W. W. Day, Jr.
MF, WN, PS, GS, GH

TURCO PRODUCTS, INC.
6135 S. Central Ave., Los Angeles, Calif. (Tel. ADams 2-6111)
Dir.-Purch.: A. H. Dekker
Los Angeles Purch.: D. W. Eckroad
Dir.-Sales: Dan T. Buist
MF, WN, PS, GS, GH, CO, TS

C. K. TURK CORP.
1122 Mishawaka Ave., South Bend, Ind. (Tel. AT 9-6311)
V. P.-Purch.: R. D. Turk
Purch.: H. J. Barrett **WN, GS**

TWIN COACH CO.-AIRCRAFT DIV.
P. O. Box 2507, Buffalo 25, N. Y. (Tel. PLaza 5150)
Materials Mgr.: H. E. Rhoads
V. P.-Contracts Admin.: G. R. Hecht
MF, WN

TWIX MFG. CO., INC.
40-09 21st St., Long Island City 1, N. Y. (Tel. STillwell 4-0530)
V. P.-Purch.: D. J. O'Brien
Purch. Agent: B. Pilmer
Jr. Buyer: R. Quinn
V. P.-Sales: J. Albert

E. F. TWOMEY CO., INC.
728 W. 10th Pl., Los Angeles 15, Calif. (Tel. RI 9-9451)
Secy.-Treas.: E. F. Twomey, Jr.
MF, GS

TYPHOON AIR CONDITIONING CO., DIV.-HUPP CORP.
505 Carroll St., Brooklyn 15, N. Y. (Tel. ULster 8-0800)
Purch. Agent: George W. Weinberg
Asst. Purch. Agent: T. E. Krawetz
V. P.-Sales: John A. Gilbreath
MF, GS, GE

U M & F MFG. CO.
10929-39 Vanowen St., N. Hollywood, Calif. (Tel. POplar 6-9425)
Purch. Agent: Wm. J. Brownell, Jr.
Sales Mgr.: Patrick G. Smaldone

UCINITE CO., THE, DIV.-UNITED-CARR FASTENER CORP.
459 Watertown St., Newtonville, Mass. (Tel. LAsall 7-8400)
Purch. Agent: T. J. Costello
Sales: G. V. Sweetnam
MF, WN, PS, GS, GH, GE, TR

GEORGE ULANET CO.
413 Market St., Newark 5, N. J. (Tel. MA 2-4876)
Sales: H. Ulanet

ULTRA ELECTROFORMING & MFG. CO.
110 Cedar Ave., Pitman, N. J. (Tel. LUther 9-7666)
Treas.: E. P. Carter

ULTRADYNE, INC.
P. O. Box 3308, Albuquerque, N. Mex. (Tel. AMherst 8-2431)
Purch. Agent: Jack Kennedy
Gen. Sales Mgr.: Victor V. Myers

ULTRA-VIOLET PRODUCTS, INC.
5114 Walnut Grove Ave., San Gabriel, Calif. (Tel. CUmberland 3-3193)
Factory Supt.: Melvin D. Hershey
Sales Mgr.: H. G. Porter
MF, WN, PS, GS, CO, TS, TR

UNGAR ELECTRIC TOOLS, INC.
4101 Redwood Ave., Los Angeles 66, Calif. (Tel. EXmont 8-5718)
Purch. Agent: Frank D. Hurd

UNIFLOW VALVE CORP.
19 Quine St., Cranford, N. J. (Tel. BR 6-8300)
Purch.: M. Swinske **PS, GS**

UNIFORM TUBES, INC.
Level Rd., Collegeville, Pa. (Tel. HUxley 9-7276)
Plant Supt.: A. B. Mainwaring
Sales Mgr.: D. T. MacNair **PS**

UNIMAX SWITCH DIV.
Ives Rd., Wallingford, Conn. (Tel. COlony 9-8701)
Purch. Agent: J. Osias
Sales Mgr.: J. Martinez **GE**

UNION ASBESTOS & RUBBER CO.
1111 W. Perry St., Bloomington, Ill. (Tel. 3-8081)
Purch. Agent: L. Vicha
Sales Mgr.: E. T. Plummer
MF, WN, PS, TR

★UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.
Braddock Ave., Pittsburgh 18, Pa. (Tel. CHurchill 2-5000)
V. P.-Purch.: R. M. Hornbeck
Asst. Dir.-Purch.: R. E. Moritz
Purch. Agent: H. I. McKeever
Mgr.-Gen. Apparatus Sales: P. K. Eckhardt
GE, CO, TS, TR
★(See advertisement in this issue)

UNIT PROCESS ASSEMBLIES, INC.
61 E. 4th St., New York 3, N. Y. (Tel. SPring 7-1398)
Purch.: C. Cirilli
Sales Mgr.: S. U. Lieber **TS**

★UNITED AIRCRAFT PRODUCTS, INC.
1116 Bolander Ave., Dayton, O. (Tel. BAldwin 4-3841)
Dir.-Purch.: John Shroyer
Sales Mgr.: Frank A. Ryan
MF, WN, PS, GS, GH, GE, TS, TR
★(See advertisement in this issue)

UNITED CARBON PRODUCTS CO.
1318 N. Madison St., Bay City, Mich. (Tel. TWinbrook 3-4575)
Purch. Agent: M. D. Sordyl
Sales Mgr.: E. J. Musinski **PS, GS**

UNITED CONTROL CORP.
4540 Union Bay Pl., Seattle 5, Wash. (Tel. LAkeside 5-9200)
Materiel Dir.: Martin K. Lilleberg
Asst. Materiel Dir.: Hugh LaVille
Sales Mgr.: Howard H. Suskin
MF, PS, GS, GH, GE, CO, TS, TR

UNITED ELECTRODYNAMICS, DIV.-UNITED GEOPHYSICAL CORP.
1200 S. Marengo Ave., Pasadena, Calif. (Tel. SYcamore 9-7161)
Purch.: E. H. Lemke, W. G. Martin & C. D. Morrison
Sales Mgr.: F. A. Fleck

UNITED ELECTRONICS CO.
42 Spring St., Newark 4, N. J. (Tel. HUmboldt 2-0576)
Purch. Agent: Mrs. Josephine Brown
Sales Mgr.: David W. McCormick
GE, TS, TR

UNITED MFG. CO., THE
5250 Dobeckmun Ave., Cleveland 2, O. (Tel. OLympic 1-6310)
Purch. Agent: Marc P. Raia
V. P.-Sales: Joseph N. Ryder
MF, WN, PS, GS, GH, GE, TS, TR

UNITED MFG. CO. DIV., THE W. L. MAXSON CORP.
41 Haig St., Hamden 14, Conn. (Tel. New Haven-CH 8-4491)
Purch. Agent: C. W. Redmond
GS, GH, TS

UNITED MINERAL & CHEMICAL CORP.
16 Hudson St., New York 13, N. Y. (Tel. Beekman 3-8870)
Purch. Agent: Terry D. Koncelik
Sales: Herbert M. Rosenthal
MF, PS, GS, GE, TR

UNITED SHOE MACHINERY CORP.
140 Federal St., Boston 7, Mass. (Tel. LIberty 2-9100)
Mgr.-Purch. Dept.: A. L. Neff
Purch.: R. J. Carroll, H. F. Pfaff, Norman Hill & George E. Bowen
V. P.-Sales: C. R. Todd
MF, WN, PS, GS

UNITED SMELTING & ALUMINUM CO., INC.
P. O. Box 1910, New Haven, Conn. (Tel. MA 4-2181)
Gen. Supt.: F. A. Merliss
Exec. V. P.-Sales: Milton E. Rosenthal
MF

U. S. COMPONENTS INC.
454 E. 148th St., New York 55, N. Y. (Tel. CYpress 2-6525)
V. P.-Purch.: B. A. Jackson
Sales: H. Nalbantian
PS, GS, GH, GE, CO, TS, TR

U. S. GAUGE DIV.,-AMERICAN MACHINE & METALS, INC.
Sellersville, Pa. (Tel. ALpine 7-6531)
Dir.-Proc.: Clayton Kirkpatrick
Purch. Agent: M. H. Blackwell
Mgr.-Aircraft Sales: David A. Winer
PS, GE, CO, TS, TR

★U. S. GEAR CORP.
81 Bay State Rd., Wakefield, Mass. (Tel. CRystal 6-4900)
Engr.-Purch.: A. P. Cotreau
Estimator: Harold H. Archer
Sales Mgr.: David M. Abbot PS, GS
★(See advertisement in this issue)

U. S. HAMMERED PISTON RING CO., INC.
Rail Road Ave., Stirling, N. J. (Tel. MIllington 7-0100)
V. P.-Purch.: A. A. Wenzel
Purch.: R. Bossmann & A. Thoms
MF, WN, PS, GS

UNITED STATES CHEMICAL MILLING CORP.
1700 Rosecrans Ave., Manhattan Beach, Calif. (Tel. ORegon 8-4041)
Purch. Agent: James E. Bates
Mgr.-Contract Engrg.: Merrill L. Johnson

UNITED STATES DYNAMICS CORP.
1250 Columbus Ave., Boston 20, Mass. (Tel. HI 5-3850)
Gen. Mgr.: Edward J. Cagney
Sales Mgr.: J. F. Eaton
PS, GS, GH, GE, TR

UNITED STATES PLASTIC ROPE, INC.
2581 Spring St., Redwood City, Calif. (Tel. EMerson 8-1461)
Gen. Mgr.: James G. Allio GS

UNITED STATES PLYWOOD CORP.
55 W. 44th St., New York, N. Y. (Tel. MU 2-1900) GS

UNITED STATES RADIUM CORP.
P. O. Box 246, Morristown, N. J. (Tel. JEfferson 9-4000)
Purch. Agent: R. Van Epps
Asst. Purch. Agent: D. Weaver
V. P.-Sales: C. W. Wallhausen
MF, WN, PS, GE, CO, TS, TR

UNITED STATES STEEL CORP.
525 William Penn Pl., Pittsburgh 30, Pa.
Media Suprvsr.: A. F. Berliner MF, PS

UNITED STATES VARNISH CO.
P. O. Box 2, 1625 Franklin Ave., Hasbrouck Hts., N. J. (Tel. ATlas 2-0373)
Purch.: Henry G. Hose

UNITED SUPPLY CO.
3676 S. Broadway Pl., Los Angeles 7, Calif. (Tel. ADams 3-4384)
Purch. Agent: Harry L. Guss
Sales Mgr.: Morris C. Guss
MF, WN, PS, GS, GH, GE

UNITED TRANSFORMER CORP.
150 Varick St., New York 13, N. Y. (Tel. ALgonquin 5-3500)
Purch. Agent: J. Kramer
Sales Mgr.: H. Russell
GS, GE, CO, TS, TR

UNITED-CARR FASTENER CORP.
31 Ames St., Cambridge 42, Mass. (Tel. KIrkland 7-4900)
Purch. Agent: F. J. Ross
Asst. Purch. Agent: David Erb
Sales: Arthur W. Rice, Jr.
MF, WN, PS, GS, GH, GE, TR

UNIVERSAL CIRCUIT CONTROLS CORP.
3610 Oakton St., Skokie, Ill. (Tel. ORchard 5-2620)
Chief Engr. & Gen. Mgr.: Sander B. Friedman
Dir.-Sales: Ivan Himmel GE, TR

UNIVERSAL DRAFTING MACHINE CORP.
7960 Lorain Ave., Cleveland 2, O. (Tel. OL 1-4747)
Purch. Agent: R. F. Barnes
Asst. Purch. Agent: D. DeVito
V. P.-Sales: S. W. Hoover

UNIVERSAL DYNAMICS CORP.
1441 N. 19th St., Arlington 9, Va. (Tel. JAckson 5-4541)
Purch. Agent: David L. Watson
Sales Mgr.: Kirk L. Burns
MF, PS, GS, GH, GE, CO, TS, TR

UNIVERSAL ELECTRIC CO.
300 E. Main St., Owosso, Mich. (Tel. SAratoga 5-7174)
Dir.-Purch.: Gerald Hoddy
Dir.-Sales: A. E. Kerscher PS

UNIVERSAL ELECTRONICS CO.
1720 22nd St., Santa Monica, Calif. (Tel. EX 3-7707)
Owner: Edward Lacey PS, GS, GE

UNIVERSAL MACHINE CO., INC.
316 Lincoln St., Fenton, Mich. (Tel. MAin 9-2293)
Purch. Agent: Byron S. Scott
Purch. Agent-Head Sales: John Donald Jordan MF, PS

UNIVERSAL METAL PRODUCTS INC.
331 Vineland Ave., Puente, Calif. (Tel. EDgewood 6-4561)
Purch. Agent: Gene Knowles
Sales Mgr.: O. J. Miller MF, WN, PS

UNIVERSAL MICROPHONE CO.
Box 55, Inglewood, Calif. (Tel. EX 8-6898)
V. P.-Purch.: D. M. Harrison GS

UNIVERSAL TRANSISTOR PRODUCTS CORP.
17 Brooklyn Ave., Westbury, N. Y. (Tel. EDgewood 3-3304)
Purch. Agent: I. R. Zeller
GS, GH, GE, CO, TS, TR

UNIVERSAL UNLIMITED, INC.
Pratt Oval, Glen Cove, N. Y. (Tel. GLen Cove 4-6400)
Purch. Agent: Henry J. Belmont
Sales Mgr.: Felix La Mar
MF, GE, TS, TR

UNIVERSITY LOUDSPEAKERS, INC.
80 S. Kensico Ave., White Plains, N. Y. (Tel. WHite Plains 6-7700)
Purch. Agent: Seymour Blumenfeld
Dir.-Sales & Merchandising: Lawrence J. Epstein GS

UNIWAVE, INC.
109 Marine St., Farmingdale, N. Y. (Tel. CH 9-8180)
MF, WN, PS, GS, GH, GE, CO, TS, TR

UTICA DROP FORGE & TOOL DIV.-KELSEY HAYES CO.
2415 Whitesboro St., Utica 4, N. Y. (Tel. 5-6411)
Purch. Agent: Russell Jones
Asst. Purch. Agent: E. Kern
Mgr.-Missile Div.-Sales: W. K. Norris
MF, WN, PS, GS

VACAP CORP.
1905 Summit Ave., Union City, N. J. (Tel. UNion 7-6630)
V. P.-Purch. & Sales: L. Dolinko
GH, TR

VACU-BLAST CO. INC.
Box 885, Belmont, Calif. (Tel. LYtell 3-7658)
Purch. Agent: Frank Zuest
Sales Mgr.: A. L. Hawley, Jr.

VACUUM METALS CORP., DIV.-CRUCIBLE STEEL CO. OF AMERICA
P. O. Box 977, Syracuse 1, N. Y. (Tel. HOward 8-2571)
Dir.-Purch.: R. O. Bridge, Crucible Steel Co. of America, Oliver Bldg., Pittsburgh 30, Pa. (Tel. ATlantic 1-3800)
Head-Purch. Dept.—Syracuse: F. G. Hefti
Sales Mgr.-Syracuse: F. J. Coates
MF, WN, PS

VACUUM RESEARCH CO.
420 Market St., San Francisco 11, Calif. (Tel. YUkon 2-3565)
Purch.: H. F. Perezone, 1929 Williams St., San Leandro, Calif. (Tel. LOckhaven 8-1252)
Sales: Larry Wright, San Francisco
PS, GS, GH, GE

VACUUM TUBE PRODUCTS CO. INC.
2020 Short St., Oceanside, Calif. (Tel. SAratoga 2-7648)
Purch. Agent: L. J. Huking
V. P.-Sales: J. J. Sutherland
PS, GS, GE, CO, TS, TR

★VALCOR ENGRG. CORP.
Carnegie Ave., Kenilworth, N. J. (Tel. CHestnut 5-1665)
Purch. Agent: B. P. Welt
Gen. Sales Mgr.: Murray Maslow
PS, GS, GE
★(See advertisement in this issue)

VANADIUM-ALLOYS STEEL CO.
Latrobe, Pa. (Tel. KEystone 7-5551)
Purch. Agent: Lewis M. Potter
Asst. Purch. Agent: Alex B. Smith
V. P.-Sales: R. Burns George MF, PS

VANGUARD ELECTRONICS CO.
3384 Motor Ave., Los Angeles 34, Calif. (Tel. TExas 0-8344)
Purch.: Simon A. Golbert GS, GE, TR

VAP-AIR DIV., VAPOR HEATING CORP.
6444 W. Howard, Chicago 31, Ill. (Tel. NE 1-9200)
Purch. Agent: Robert W. Currer
Buyers: Ronald R. Krenek & Frank Slapak
V. P.-Sales: L. H. Gillick
WN, PS, GS, GE, CO, TS, TR

VAPOR BLAST MFG. CO.
3025 W. Atkinson Ave., Milwaukee 9, Wis. (Tel. CUster 3-6500)
Purch. Agent: A. Odehnal
Sales Mgr.: H. F. Patin

VARD INC.
2981 E. Colorado St., Pasadena, Calif. (Tel. SYcamore 6-9281)
Purch. Mgr.: Gordon Withall
Buyers: Jim Gilbert, John Allen & Groff Brown
Exec. V. P.-Sales: Phillip R. Heim

VARFLEX CORP.
512 W. Court St., Rome, N. Y. (Tel. 4099)
Purch.: Merrick Drummond
Sales: J. H. Finnegan MF, WN, PS

VARI-L CO., INC.
432 Fairfield Ave., Stamford, Conn. (Tel. FIreside 8-0091)
Pres.: J. L. Kiser GS, TS, TR

VARO MFG. CO.
2201 Walnut St., Garland, Tex. (Tel. BR 6-6141)
Purch. Agent: Brad Riggs
Buyers: Bill Bonds & Al Armstrong
Mgr.-Customer Relations: J. R. Gilmer
PS, GS, GH, GE, CO, TS, TR

CODING

Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

VECTOR ELECTRONIC CO.
1100 Flower St., Glendale 1, Calif. (Tel. CH 5-1076)
Purch. Agent: Jerry Strickland
Buyers: Estelle Casseda & Lee Buck
Sales Mgr.: John R. Hart
MF, GE, TS, TR

VECTRON, INC.
1566 Trapelo Rd., Waltham 54, Mass. (Tel. TWinbrook 3-8700)
Purch. Agent: M. D. Granville
Gen. Sales Mgr.: Howard M. Jones

VEECO VACUUM CORP.
86 Denton Ave., New Hyde Park, L. I., N. Y. (Tel. PI 6-1161)
Purch. Agent: E. Potter
V. P.-Sales: A. Nerken
PS, GS, GH, GE, CO, TS, TR

VEEDER-ROOT INC.
70 Sargeant St., Hartford 2, Conn. (Tel. JAckson 7-7201)
Purch. Agent: R. I. Bond
Sales Mgr.: G. Cogan CO, TS, TR

VEET INDUSTRIES
25753 Groesbeck Hwy., E. Detroit, Mich. (Tel. PRescott 6-3000)
Purch. Agent: A. Stewart
Sales Mgr.: W. Clyde Nav PS

VEMALINE PRODUCTS CO.
P. O. Box 222, Hawthorne, N. J. (Tel. MUlberry 4-4688)
Purch. Agent: Wm. Venema
MF, WN, PS, GS, GH, GE, CO, TR

★VENDORLATOR MFG. CO.
2550 S. Railroad Ave., Fresno, Calif. (Tel. AMhert 6-9401)
Purch. Agent: O. J. McMillin
Asst. Purch. Agent: Howard Henry
GH
★(See advertisement in this issue)

VIBRA SEAL CORP.
2832 E. Grand Blvd., Detroit 11, Mich. (Tel. TRinity 1-5130)
Gen. Mgr.: S. Wiltse
MF, PS, GS, GH, GE

VIBRATION RESEARCH LABS., INC.
58 Marbledale Rd., Tuckahoe, N. Y. (Tel. WOodbine 1-2440)
Purch. Agent: George Barrere
GS, GH, GE, TS, TR

VICKERS INC., DIV.-SPERRY RAND
Administrative & Engrg. Ctr., Detroit 32, Mich. (Tel. Royal Oak—LIberty 9-1122)
Gen. Purch. Agent: R. V. Sharkey
Gen. Sales Mgr.: J. T. Burns
MF, WN, PS, GS, GH, GE, TS, TR

★VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
172 E. Aurora St., Waterbury 20, Conn. (Tel. PLaza 6-3681)
Purch. Agent: Harold Carberry
Sales Mgr.: R. J. Mitchell
★(See advertisement in this issue)

VICKERY CO., THE
610 16th St., Oakland, Calif. (Tel. GLencourt 1-1160)
Purch. & Sales: Herb Vickery
Controller: Alice M. Vickery
PS, GS, GH

VICTOR ADDING MACHINE CO.
3900 N. Rockwell St., Chicago 18, Ill. (Tel. KEystone 9-8210)
Purch. Agent: John Jasch
Sales Mgr.-Electronics: R. R. Howard
TR

VICTOR ELECTRIC WIRE & CABLE CORP.
618 Main St., W. Warwick, R. I. (Tel. VAlley 1-1700)
Sales: Norman Brill
MF, PS, GS, GH, GE, TS, TR

VICTOR MFG. & GASKET CO.
5750 W. Roosevelt Rd., Chicago 50, Ill. (Tel. AUstin 7-6180)
Gen. Purch. Agent: Harold G. North
Gen. Sales Mgr.-Industrial Div.: Albert J. Aukers MF, PS

VICTORY ENGINEERING CORP.
50 Springfield Rd., Union, N. J. (Tel. MUrdock 8-7150)
Purch. Agent: R. W. Blimm
Sales: W. B. Huston
PS, GS, GE, CO, TS, TR

VIDEO INSTRUMENTS CO., INC.
3002 Pennsylvania Ave., Santa Monica, Calif. (Tel. EXbrook 3-1244)
Prod. Mgr.: Charles Seelig
V. P.-Sales: Peter Pohl

VIDEON ELECTRONIC CORP.
902 E. Michigan St., Indianapolis 2, Ind. (Tel. MElrose 6-5461)
Purch. Agent: Charles Gallagher
Sales Mgr.: Arthur J. Schultz
GE, TS, TR

VINCO CORP.
9111 Schaefer Hwy., Detroit 28, Mich. (Tel. WEbster 3-4350)
Purch. Agent: E. L. Camen
Asst. Buyer: J. Davis
Asst. Sales Mgr.: J. J. Kessel
WN, PS, GS

VINSON MFG. CO. INC.
8044 Woodley Ave., Van Nuys, Calif. (Tel. STanley 3-2576)
Factory Mgr.: H. Weimer
Sales: Ray Wilber
MF, WN, PS, GS, GH, GE, TS, TR

VIRGINIA PLAK CO.
270 Madison Ave., New York 16, N. Y. (Tel. MUrray Hill 3-9516)
Gen. Mgr.: S. N. Weis
MF, WN, GE, CO, TS, TR

VITRAMON, INC.
Box 544, Bridgeport, Conn. (Tel. AMherst 8-1656)
Purch. Agent: William Osowski
Buyer: Dorothy Kasperait
Sales Mgr.: Clifford H. Tuttle, Jr.
GE, TR

VLCHEK TOOL CO., THE
3001 E. 87th St., Cleveland 4, O. (Tel. GA 1-2480)
Purch. Agent: F. J. Tkach
V. P.-Sales: L. F. Storie MF

VOI-SHAN MFG. CO., DIV.-PHEOLL MFG. CO.
8463 Higuera St., Culver City, Calif. (Tel. TExas 0-5321)
Purch. Agent: Miss Glory Fields MF

VORAC CO., THE
147 Meadow Rd., Rutherford, N. J. (Tel. GEneva 8-0934)
Dir.-Purch.: Robert Geist
Asst. to Dir.-Purch.: M. Haber
V. P.-Sales: D. E. Hartman
MF, WN, PS, GS, GE, TS

VOUGHT CO.
8907 Melrose Ave., Los Angeles 46, Calif. Mailing Add.: P. O. Box 1350, Beverly Hills, Calif. (Tel. CR 6-1131)
Contract Officer: W. E. Lanctot
Mgr.-Sales: A. D. Fraser GS, GE, TR

VULCAN ELECTRIC CO., DIV.-CONSOLIDATED ELECTRIC LAMP CO., INC.
88 Holten St., Danvers, Mass. (Tel. SPring 4-1730)
Purch. Agent: J. O. Harris
Buyer: R. F. Perry
Sales Mgr.: L. A. Brett PS, GS, GH

WJZ TOOL SPECIALTIES
E. Park Rd., Hyde Park, N. Y. (Tel. CApitol 9-2929)
Sales Mgr.: Jed Daly

WAAGE ELECTRIC, INC.
720 Colfax Ave., Kenilworth, N. J. (Tel. CHestnut 5-9363)
Curtis Frantz GS

WACLINE, INC.
35 S. St. Clair St., Dayton 2, O. (Tel. BAldwin 8-5161)
Purch. Agent: R. G. Swanson
V. P.-Sales: M. E. Goll
PS, GS, GE, CO, TS, TR

H. A. WAGNER CO.
14707 Keswick St., Van Nuys, Calif. (Tel. STate 6-1090)
Purch. Agent: R. H. Guild

WAGNER AWNING & MFG. CO., THE
2658 Scranton Rd., Cleveland, O. (Tel. TOwer 1-5400)
Purch. Agent: C. Yamek, Jr.
Exec. V. P.-Sales: Larry R. Brahs
MF, WN, PS, GS

WAKEFIELD ENGRG. CO.
P. O. Box 471, Coeur d'Alene, Idaho (Tel. MUrray 5 5541)
V. P.: D. Bresnan GS

WAKMANN WATCH CO. INC.
15 W. 47th St., New York, N. Y. (Tel. JU 6-1750) GE, CO, TR

WALBAR MACHINE PRODUCTS, INC.
74 Maple St., Stoneham, Mass. (Tel. STtoneham 6-3035)
Purch. Agent: James W. Gallagher
Sales Mgr.: T. John Caveney PS

WALDICK ENGRG. CO.
P. O. Box 398, Huntington Station, N. Y. (Tel. HAmilton 7-6780)
Mgr.: W. Dickman MF, PS, GS

WALDOM ELECTRONICS INC.
4625 W. 53rd St., Chicago 32, Ill. (Tel. LUdlow 5-1212)
MF, WN, PS, GS, GH, GE, CO, TS, TR

WALDORF INSTRUMENT CO., DIV.- F. C. HUYCK & SONS
Wolf Hill Rd., Huntington Station, N. Y. (Tel. HAmilton 7-7500)
Purch. Dir.: N. Schwetz
Raw Material Buyer: E. Stockus
Buyer-Electronics Div.: A. Fritz
Subcontr. Buyer-Electronics Div.: R. Hock
Subcontr. Buyer-Fluid Systems Div.: H. Issackson
V. P.-Sales, Fluid Systems Div.: Fred A. Winzer, Jr.
MF, WN, PS, GS, GH, GE, TS, TR

WALES STRIPPIT CO., UNIT OF HOUDAILLE INDUSTRIES, INC.
Buell Rd., Akron, N. Y. (Tel. 9441)
Purch. Agent: George MacFayden
Gen. Sales Mgr.: Russell S. Johnson
MF, GS

WALKIRT CO.
141 W. Hazel St., Inglewood 3, Calif. (Tel. ORegon 8-4814)
Purch.: L. Wilgus
Gen. Mgr.-Sales: Wes L. Kirchoff
GS, GE, CO, TS, TR

★WALL COLMONOY CORP., STAINLESS PROCESSING DIV.
(See Stainless Processing Div., Wall Colmonoy Corp.)
★(See advertisement in this issue)

P. WALL MFG. CO.
Erie St., Grove City, Pa. (Tel. 910)
Purch. Agent: Paul Northcott
V. P.-Sales: M. A. Silverman GS, GH

WALLACE PROCESS PIPING CO., INC.
P. O. Box 9658, Wright Station, Norfolk, Va. (Tel. JUstice 7-8718)
Purch. Agent: Phil Uhler

WALLINGFORD STEEL CO.
Valley St., Wallingford, Conn. (Tel. COlony 9-3361)
Purch. Agent: D. Norton Williams
Asst. Purch. Agent: William Dennison
V. P.-Chg. Sales: G. J. Griffin
MF, PS

WALTHAM ELECTRONICS CORP.
751 Main St., Waltham 54, Mass. (Tel. TWinbrook 4-6048)
Purch. Agent: Irving Kadesh

WALTHAM SCREW CO.
77 Rumford Ave., Waltham 54, Mass. (Tel. TWinbrook 3-5830)
Purch. Agent: Charles L. Smith
MF, WN, PS

WANG LABS., INC.
37 Hurley St., Cambridge 41, Mass. (Tel. UNiversity 4-8380) GS, GE, CO, TS, TR

WAPPLER, INC.
27-10 Astoria Blvd., Long Island City 2, N. Y. (Tel. RA 8-8831)
Purch. Agent: Frederick H. Wappler

WARREN MFG. DIV., WARREN BROTHERS ROADS CO.
32 Potter St., Cambridge, Mass. (Tel. TRowbridge 6-2140)
Purch. Agent: R. A. Hansen
Gen. Mgr.-Sales: J. F. Comeau

WARREN TRANSFORMER CO., INC.
103 Warren St., Tunkhannock, Pa. (Tel. TErrace 6-8411)
Gen. Mgr.: G. W. Maslin
MF, GS, GE, TS, TR

WARREN WIRE CO.
Pownal, Vt.; Alhambra, Calif. (Tel. VAlley 3-7321)
Purch.: John Barber
V. P.-Sales: F. W. Kunzelmann

★WASHINGTON ALUMINUM CO., INC.
Knecht Ave. & Pennsylvania Railroad Baltimore 29, Md. (Tel. CIrcle 2-1000)
Purch. Agent: Bruner Dicus
V. P.: Robert S. Sanford
MF, WN, PS, GS, GH, GE, TS, TR
★(See advertisement in this issue)

WASHINGTON TECHNOLOGICAL ASSOCIATES INC.
215 Rollins Ave., Rockville, Md. (Tel. HAzelwood 7-7550)
Chief Purch. Agent: Jack Walker
GS, GH, TS

WASTE KING CORP., TECHNICAL PRODUCTS DIV.
4600 S. Pacific Blvd., Los Angeles 58, Calif. (Tel. LUdlow 3-4721)
Mgr., Mfg. Services: J. Winslow
Buyers: M. C. Beatty, J. Donegan & L. Cheek MF, WN, PS, GE, TS

WATERBURY COMPANIES, INC.
835 S. Main St., Waterbury, Conn. (Tel. PL 6-5551)
V. P.-Chg. Purch.: H. H. Carder
Purch. Agent: F. Johnson
V. P.-Sales: W. F. Reibold
MF, WN, PS, GS, TR

WATERBURY PRESSED METAL CO., THE
300 Chase Ave., Waterbury, Conn. (Tel. PLaza 4-6189)
Purch. Agent: H. R. Morrow
Sales Mgr.: Miss Merle Munson MF

WAUGH ENGRG. CO.
7842 Burnet Ave., Van Nuys, Calif. (Tel. ST 3-1055)
Purch. Agent: Allan Grotsky
Sales Mgr.: Alfred C. Catland, Jr.
PS, GH, GE, CO, TS, TR

WAVEFORMS, INC.
333 6th Ave., New York 14, N. Y. (Tel. WAtkins 9-2795)
Gen. Mgr.: A. E. Byers
GS, GE, CO, TS, TR

WAVEGUIDE, INC.
14837 Oxnard St., Van Nuys, Calif. (Tel. STanley 3-1527)
Purch. Agent: N. C. Glass
Sales Engr.: A. R. Theal
MF, WN, PS, GS, GE, CO, TS, TR

WAVELINE, INC.
Passaic Ave., Caldwell, N. J. (Tel. CApitol 6-9100) GE, CO, TS, TR

WAVE/PARTICLE CORP.
P. O. Box 252, Menlo Park, Calif. (Tel. EMerson 8-1579)
Purch. Agent: F. Geisler

WAYNE FOUNDRY & STAMPING CO.
3100 Hubbard, Detroit 10, Mich. (Tel. TAshmoo 5-8226)
Purch. Agent: Richard Lind
Sales Mgr.: John Kowalic MF, WN, PS

WAYNE PUMP CO., THE
Herbert, Riverbend & Griffin Sts., Ft. Wayne 4, Ind. (Tel. EAstbrook 4664)
Purch. Agent: V. O. Pontius
Dir.-Sales: R. L. Burke, Jr. PS, GS, GH

WAYNE-GEORGE CORP.
1117 Commonwealth Ave., Boston 15, Mass. (Tel. STadium 2-3737)
Buyer: Elbert H. Ward GE, TR

WEATHERHEAD CO., THE
300 E. 131st St., Cleveland 8, O. (Tel. GL 1-5200)
Purch. Agent: John R. Summers
Asst. Gen. Sales Mgr.-Aviation & Ord. Div.: S. C. Howell MF, PS, GS

WEBBER ENGRG. CORP.
P. O. Box 217, Indianapolis 6, Ind. (Tel. MElrose 4-5855)
Plant Supt.: Donald E. Fagin TS

WEBCOR, INC., GOVERNMENT DIV.
816 N. Kedzie Ave., Chicago 51, Ill. (Tel. NEvada 2-3425)
Dir.-Purch.: C. S. Wybran
Buyers: G. L. Scheel, P. S. Kibler & J. F. Frisby
MF, WN, PS, GS, GH, GE, TS, TR

WEBER AIRCRAFT CORP.
2820 Ontario St., Burbank, Calif. (Tel. VIctoria 9-1181)
Dir.-Materiel: Fred Good
Purch. Suprvrs.: Richard Askew & Ross Fulbright
Dir.-Military Sales: Harold G. Johnson
MF, WN, PS

WECKESSER CO.
5701 Northwest Hwy., Chicago 30, Ill. (Tel. ROdney 3-6688)
Gen. Mgr.: H. A. Ewalt
GS, GH, TS, TR

WEIGHING & CONTROL COMPONENTS, INC.
206 Lincoln Ave., Hatboro, Pa. (Tel. OSborne 5-4100)
Head-Purch. Dept.: Alfred Krieg
Head-Sales: Henry J. Oursler

WEINSCHEL ENGRG.
10505 Metropolitan Ave., Kensington, Md. (Tel. LOckwood 4-0122)
Purch. Agent: Joseph H. West
Sales Mgr.: Edward Birochak
GS, GE, CO, TS, TR

WEKSLER INSTRUMENTS CORP.
195 E. Merrick Rd., Freeport, L. I., N. Y. (Tel. MAyfair 3-0100)
Purch. Agent: Milford Himmel
V. P.-Sales: F. J. Pla TS

WELDMATIC DIV., UNITEK CORP.
380 N. Halstead Ave., Pasadena, Calif. (Tel. SYcamore 5-5995)
Purch. Agent: James I. Runyon
Gen. Mgr.: Gerald E. Woods

S. K. WELLMAN CO., THE
200 Egbert Rd., Bedford, O. (Tel. BEdford 2-2400)
Purch. Agent: Frank C. Yehl
V. P.-Sales: W. E. Canfield
MF, WN, PS, GH

WELLMAN BRONZE & ALUMINUM CO.
12800 Shaker Blvd., Cleveland, O. (Tel. WYoming 1-7000)
Purch. Agent: B. E. Weimer
V. P.-Chg. Sales: Glenn F. Ihrig MF

WELLS INDUSTRIES CORP.
6880 Troost Ave., N. Hollywood, Calif. (Tel. STanley 7-3353)
Purch. Agent: E. D. Rich
Dir.-Contracts: R. W. Chadney
MF, PS, GS, GH, GE, CO, TS

WENCO MFG. CO.
1135 W. Hubbard St., Chicago 22, Ill. (Tel. CHesapeake 3-3535)
Office Mgr.-Purch.: E. A. Melsheimer
Sales: A. N. Wentink
MF, WN, PS, GS, TR

★R. D. WERNER CO. INC.
P. O. Box 580, Greenville, Pa. (Tel. 1600)
MF, PS
★(See advertisement in this issue)

ALBERT WESLING & SONS INC.
2912 W. Lake St., Chicago 12, Ill. (Tel. KEdzie 3-2850)
Sales: A. H. Wesling GS

WESTBURY ELECTRONICS INC.
300 Shames Dr., Westbury, L. I., N. Y. (Tel. EDgewood 4-8300)
Purch. Agent: William McBride
Gen. Sales Mgr.: H. R. Clark
WN, GS, GH, GE, CO, TS, TR

WESTERN ARC WELDING, INC.
749 Kohler St., Los Angeles 21, Calif. (Tel. VA 0751)
Chief Engr.: E. Sherrick
MF, WN, PS, GS, GE, TS

CODING	
Missile Frame	MF
Warhead & Nose Cone	WN
Propulsion System	PS
Ground Support	GS
Ground Handling	GH
Guidance Equipment	GE
Check-out Equipment	CO
Test Equipment	TS
Tracking & Telemetering	TR
Research & Development	RE

WESTERN AUTOMATIC MACHINE SCREW CO., DIV.-STANDARD SCREW CO.
377 Woodward Ave., Elyria, O. (Tel. FAirfax 3-3341)
Purch. Agent: A. Steller
V. P.-Chg. Sales: M. R. Sorensen
MF, WN, PS

WESTERN COATING CO.
85 W. Union St., Pasadena 1, Calif. (Tel. RYan 1-7828)
Prod. Mgr.: Franklin Evans, P. O. Box 598, Oakridge Sta., Royal Oak, Mich. (Tel. JUniper 8-3311)
Sales Mgr.: Arthur Aaron, Royal Oak, Mich.

WESTERN COIL PRODUCTS CO.
969 Commercial St., Palo Alto, Calif. (Tel. DAvenport 5-2718)
Pres.: E. L. Peterson GE, TS, TR

WESTERN ELECTRIC CO., INC.
195 Broadway, New York, N. Y. (Tel. WOrth 4-2100)
V. P. (Sandia Operations):
James W. McRae
V. P. (Defense Project Div.):
W. E. Burke

WESTERN ELECTRO-ACOUSTIC LAB.
11789 San Vicente Blvd., Los Angeles 49, Calif. (Tel. GRanite 7-9441)
Purch.: Paul S. Veneklasen
Research Engr.: Herbert A. Gold
MF, PS, GS, GH, GE, CO, TS, TR

WESTERN FELT WORKS
4115 Ogden Ave., Chicago, Ill. (Tel. CRawford 7-8000)
Purch. Agent: L. W. Heide
Prod. Control: Gene Wojcik
Sales Mgr.: R. H. Butz
MF, WN, PS, GS

WESTERN GOLD & PLATINUM
525 Harbor Blvd., Belmont, Calif. (Tel. LYtell 3-3121)
Purch. Agent: Bradford Gibson
Sales Mgr.: Harry Mason
MF, WN, PS, GE, TR

WESTERN INSULATED WIRE CO.
2425 E. 30th St., Los Angeles 58, Calif. (Tel. LUdlow 7-7103)
Mgr.-Purch.: Phil Ramos
V. P.-Mgr. of Sales: Ed Kanner
GS, TR

WESTERN INTERNATIONAL CO.
45 Vesey St., New York 7, N. Y. (Tel. DIgby 9-2277)
Purch. Agent: E. R. Reilly
MF, PS, GS, GH, GE, TS, TR

WESTFIELD METAL PRODUCTS CO., INC.
1040 Lower Union St., Westfield, Mass. (Tel. LOgan 2-3614)
Purch. Agent: James A. Pool MF

WESTHOLT MFG. CO.
925 W. Harry, Wichita, Kans. (Tel. AM 5-9668)
Suprvsr.-Estimating & Purch.: C. Ernest Fry
V. P.-Gen. Mgr.: Willard M. Bashaw
MF, PS, GS

★WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
P. O. Box 36, Wilmerding, Pa. (Tel. BRandywine 1-1490)
Dir.-Purch.: R. M. Hornbeck
Asst. Dir.-Purch.: R. E. Moritz
Buyers: H. I. McKeever, C. H. West, M. L. Stevens & J. E. Kruger
Sales Mgr.: E. L. Holbrook GS, GH
★(See advertisement in this issue)

★WESTINGHOUSE ELECTRIC CORP.
P. O. Box 868, Pittsburgh 30, Pa. (Tel. EXpress 1-2800)
Dir. Mktg.-Defense Products:
R. M. Wilson
Adv. Rep.: Clarence A. MacGregor

★AIR ARM DIVISION
P. O. Box 476, Friendship Int'l Airport, Baltimore 3, Md. (Tel. SOuthfield 1-1000)
Purch. Agent: H. A. Nicholson
MF, WN, PS, GS, GH, GE, CO, TS, TR
★(See advertisement in this issue)

WESTLAKE PLASTICS, CRYSTALX CORP.
W. Lenni Rd., Lenni Mills, Pa. (Tel. GLobe 9-1000)
V. P.-Purch.: E. F. Westlake
Sales Mgr.: W. F. Noonan, Jr.
MF, PS, GS, GE, TR

WESTLINE PRODUCTS DIV., WESTERN LITHOGRAPH CO.
600 E. 2nd St., Los Angeles 54, Calif. (Tel. TRinity 2641)
Purch. & Estimating: Laird Swan
Sales Mgr.: Maury Engle
MF, PS, GS, TR

WESTON HYDRAULICS, LTD.
10918 Burbank Blvd., N. Hollywood, Calif. (Tel. STanley 7-3201)
Dir.-Purch.: Robert E. Stevens
Asst. to Dir.-Purch.: William Bufkin
Buying Assts.: Kathryn L. Johnson & Elsie Bonin
Dir.-Sales: Fred O. Hosterman
MF, WN, PS, GS, GH, GE, CO, TS

WESTRONICS INC.
3605 McCart, Ft. Worth, Tex. (Tel. WA 3-2986)
Purch.: Mrs. D. Gorlington
Sales: George W. Puckett
GS, CO, TS, TR

WESTWOOD CABLE CORP.
3440 Overland Ave., Los Angeles, Calif. (Tel. TExas 0-6831)
Plant Mgr.: A. Shapiro
Sales Mgr.: John M. Cooner
PS, GS, GH, CO, TS, TR

WHEELER ELECTRONIC CORP., SUB.-SPERRY RAND CORP.
150 E. Aurora St., Waterbury, Conn. (Tel. PLaza 4-5191)
Purch. Agent: W. A. Collier
Sales Mgr.: R. B. Baker
GS, GE, TS, TR

WHELAND CO., THE
Signal Mountain Rd., Chattanooga, Tenn. (Tel. AM 5-3181)
V. P.-Mfg.: H. V. McDougall
Mgr.-Special Sales: L. E. Skelly
MF, WN, PS, GS, GH

WHITE & BAGLEY CO., THE
100 Foster St., Worcester 8, Mass. (Tel. PL 5-6151)
Purch. Agent: Ernest W. Foster
Sales Mgr.: Herbert P. Fleming
MF, WN, PS

★WHITE DIESEL ENGINE DIV., THE WHITE MOTOR CO.
1401 Sheridan Ave., Springfield, Ohio (Tel. FA 3-4921)
Purch. Agent: William J. Lynch
Asst. Purch. Agents:
Paul E. Dunn & Arthur Osseck
Buyer: Joe James
Sales Mgr.: J. H. Newton GS
★(See advertisement in this issue)

WHITTAKER CONTROLS, DIV.-TELECOMPUTING CORP.
915 N. Citrus Ave., Los Angeles 38, Calif. (Tel. HOllywood 4-0181)
Suprvsr.-Purch.: Frank Kurvink, 3000 Imperial Hwy., Lynwood, Calif. (Tel. NEvada 6-9271)
Sales Mgr.: Art C. Cocagne
MF, PS, GS, GH, GE, TS

WHITTAKER GYRO, DIV.-TELECOMPUTING CORP.
16217 Lindbergh St., Van Nuys, Calif. (Tel. ST 3-1950)
Purch. Agent: Vince Underwood
Buyers: Ben Valucki & J. Schwien
Dir.-Field Engrg.: Donald J. Rammage
PS, GH, GE, TS, TR

WICKES ENGRG. & CONSTRUCTION CO. INC.
12th St. & Ferry Ave., Camden, N. J. (Tel. WOodlawn 4-4912)
Purch. Agent: Herbert Chadwick
Sales: John W. Mullen
PS, GS, GH, GE, CO, TR

WICKFIELD, INC.
1511 Levee St., Dallas, Tex. (Tel. RI 1-3395)
Asst. Factory Mgr.: Paul E. Phillips
Sales Mgr.: Felton H. Havins
MF, PS, GS, GH

WIEDEMANN MACHINE CO.
4272 Wissahickon Ave., Philadelphia 32, Pa. (Tel. BAldwin 3-2850)
Purch. Agent: Joseph Hickey
Sales Mgr.: Theodore A. Wiedemann
GS

E. B. WIGGINS OIL TOOL CO. INC.
3424 E. Olympic Blvd., Los Angeles 23, Calif. (Tel. ANgelus 9-0181)
GS, GH, GE, TS

WILCOLATOR CO., THE
1001 Newark Ave., Elizabeth, N. J. (Tel. ELizabeth 4-1000)
Purch. Agent: J. Martin
Sales Mgr.: P. E. McCaughey

WILCOX ELECTRIC CO., INC.
1400 Chestnut St., Kansas City 27, Mo. (Tel. BEnton 1-0700)
Dir.-Purch.: J. Q. Kohler
Dir.-Sales: D. E. Busse
Sales Analyst: Jack F. Hill

WILLARD STORAGE BATTERY DIV.
246 E. 131st St., Cleveland 1, O. (Tel. ULster 1-2600)
Purch. Agent: D. A. Campbell
Mgr.-Sales Engrg.: C. F. Oestermeyer
GS, GH, GE, TS

J. H. WILLIAMS & CO.
400 Vulcan St., Buffalo 7, N. Y. (Tel. RIverside 3200)
Purch. Mgr.: J. P. O'Brien
Asst. to Purch. Mgr.: J. Schaner
Sales Mgr.: E. R. Burkardt
MF, WN, PS, GS

WILMAR MFG. CO., INC.
1110 Truman Rd., Kansas City, Mo. (Tel. BAltimore 1-5585)
Purch. Agent: E. R. Rhue
V. P.-Sales: D. B. Hickman
MF, WN, GS, GH, GE, TS

WILSHIRE POWER SWEEPER CO.
526 W. Chevy Chase, Glendale, Calif. (Tel. CHapman 5-5178)
Plant Mgr.: L. W. Toepper
Sales Mgr.: L. J. Langeness

G. C. WILSON & CO.
1915 8th Ave., Huntington, W. Va. (Tel. JA 3-5149)
Mgr.-Purch.: G. C. Wilson
Mgr.-Sales: J. Thomas
PS, GE, CO, TS, TR

WINATIC CORP., THE
50 Stage Rd., Vestal, N. Y. (Tel. ENdicott 8-1518)
Purch. Agent: D. A. Hertzog
Sales: R. W. Severson
PS, GE, CO, TS, TR

WINCHARGER CORP.
E. 7th & Division Sts., Sioux City 2, Iowa (Tel. 2-1844)
Purch. Agent: Tom Ryan
Buyers: L. J. Roeper & E. A. Brakke
Sales Mgr.: D. L. Moline
Mgr.-Defense Sales: R. A. Brewer
PS, GS, GH, GE, TR

WINCHESTER ELECTRONICS, INC.
Willard Rd., Norwalk, Conn. (Tel. TEmple 8-8433)
Purch.: R. Lucas
Sales: R. G. Salusbury

WINCHESTER-WEST. DIV.-OLIN MATHIESON CHEM. CORP.
275 Winchester Ave., New Haven, Conn. (Tel. SP 7-7911)
Purch. Agent: F. E. Plumley
Asst. Purch. Agent: M. W. Perrine
Buyer: W. B. Fuller
Mgr.-Industrial & Military Sales: A. S. Cogan
MF, WN, PS, GS, GH, GE

WIND TURBINE CO.
E. Market St. & P.R.R., West Chester, Pa. (Tel. OWen 6-3110)
Purch. Agent: Eugene F. Burke
Buyer: Margaret Cox
Sales Mgr.: Davis B. Oat
MF, WN, PS, GS, GE, TR

WINDER AIRCRAFT CORP. OF FLA.
P. O. Box 2397, Lakeland, Fla. (Tel. MUtual 9-6911)
Purch. Agent: Charles G. Toundas
Purch. Dept.: Mrs. Marion Wulchak & A. B. Harris
MF, WN, PS, GS, GH, GE, CO, TS, TR

J. H. WINN INC.
620 Washington St., Winchester, Mass. (Tel. WInchester 6-4400)
Purch. Agent: Arthur McWilliams
Sales Mgr.: O. T. Larson
MF, WN, PS, GE, CO, TR

WINSLOW AEROFILTER CORP.
4069-73 Hollis St., P. O. Box 8246, Oakland, Calif. (Tel. OLympic 2-0288)
Purch.: I. E. Thiele
V. P.-Sales: W. G. Nostrand PS, GS

WINTRONICS
213 S. Hawthorne Blvd., Hawthorne, Calif. (Tel. OSborne 5-1464)
Purch.: Daniel R. Winters
Sales: Frank DeJong
GE, CO, TS, TR

WIRE CO. OF AMERICA, INC.
Bldg. 247, Santa Barbara Airport, Goleta, Calif. (Tel. WOodland 7-3620)
Purch. Agent: Ed Van Wyke
MF, GS, GH, TS

WISCONSIN ALUMINUM FOUNDRY CO., INC.
838 S. 16th St., Manitowoc, Wisc. (Tel. MUrray 4-3383)
Purch. Agent: Irwin Schwartz
V. P.-Sales: Harry L. Schwartz MF

WOLLAM AIRCRAFT & MARINE PRODUCTS CO.
222 S. Mill St., Celina, O. (Tel. 2286)
V. P.: M. J. Wollam MF, PS

WOLLENSAK OPTICAL CO.
850 Hudson Ave., Rochester, N. Y. (Tel. COngress 6-1000)
Purch. Agent: Robert Kelly
Mgr.-Photo-Instrumentation Sales: Fred M. Emens

WOOLF AIRCRAFT PRODUCTS, INC.
3441 Filbert, Wayne, Mich. (Tel. PA 1-5330)
Pres.: Clarence Woolf

WORK-FACTOR CO., INC., THE
206 W. Atlantic Ave., Haddon Hts., N. J. (Tel. LIncoln 7-1676)
Field Engr.-Purch.: Donald F. Diefenderfer

WRIGHT AERONAUTICAL DIV., CURTISS-WRIGHT CORP.
Wood-Ridge, N. J. (Tel. PRescott 7-2900)
Dir.-Purch.: James M. Cowell, Jr.
V. P.-Sales: W. K. Houpt
MF, WN, PS, GS, GH

WRIGHT ELECTRONICS INC.
2537 Grand, Kansas City, Mo. (Tel. BA 1-8686)
Purch.: James J. Colbert, Jack D. Shepherd & Ned Bishop GS, GE, TR

WRIGHT EQUIPMENT CORP.
128 N. Main St., Milltown, N. J. (Tel. MIlltown 8-1400)
Purch. Agent: James Tarantiles

WRIGHT ZIMMERMAN, INC.
New Brighton, St. Paul 12, Minn. (Tel. MElrose 3-3131)
Pres.: J. D. Zimmerman
GS, GH, GE, TS, TR

WROUGHT WASHER MFG. CO.
2137 S. Bay St., Milwaukee 7, Wisc. (Tel. SHeridan 4-0771)
Purch. Agent: Maro Davis
Gen. Sales Mgr.: Walter F. Borges

WUNDERLICH RADIO CO.
105 N. Kenilworth Ave., Oak Park, Ill.
Sales: N. E. Wunderlich
PS, GS, GE, TS, TR

WYCO METAL PRODUCTS
6918 Beck, N. Hollywood, Calif. (Tel. STanley 7-5579)
Purch. Agent: L. Teitelman
GS, GH, TS

WYE INDUSTRIES
6 Gen. Devine Way, Boston 27, Mass. (Tel. AN 8-6701)
Purch. Agent: James A. Woye
MF, PS, GS, GH

WYMAN-GORDON CO.
105 Madison St., Worcester, Mass. (Tel. PLeasant 6-5111)
Exec. V. P.: H. F. Wood
Gen. Sales Mgr.: J. L. Roach
MF, WN, PS

X-PANDO CORP.
43-15 36th St., Long Island City 1, N. Y. (Tel. STillwell 4-7180)
Gen. Mgr.: John Mano, Jr.
MF, WN, PS, GS, GE

YARDNEY ELECTRIC CORP.
40-50 Leonard St., New York 13, N. Y. (Tel. WO 6-3100)
V. P.-Sales: Martin E. Kagan
GS, GH, GE

YOUNG BROTHERS CO.
1852 Columbus Rd., Cleveland 13, O. (Tel. MAin 1-2473)
Dir.-Purch.: L. Schreiber
Purch. Agent-Steel: Emil Tuteur
Purch. Agent-Components: George Kenney
V. P.-Sales: J. D. Russell

ZAGORA GEARS, INC.
1325 S. Mint St., Charlotte 3, N. C. (Tel. EDison 3-7111)
V. P.-Purch.: A. Zagora
Sales Mgr.: E. J. Zagora PS, GS

ZENITH ELECTRIC CO.
152 W. Walton St., Chicago, Ill. (Tel. MI 2-3322)
Purch. Agent: Rueben Shore
Sales Mgr.: Arthur Coren
GH, GE, CO

ZENITH OPTICAL LABORATORY
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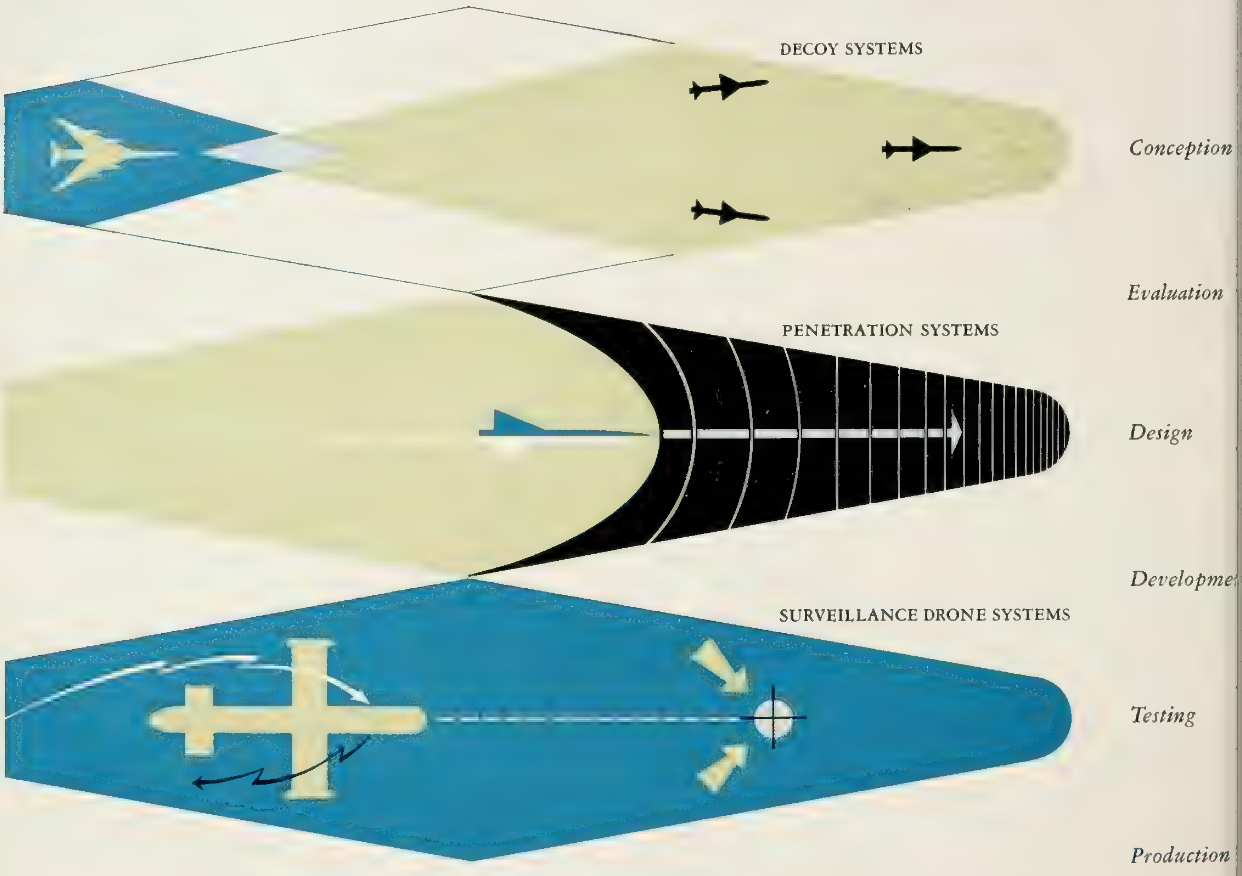
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Rubber & Asbestos Corp.
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Shell Chemical Corp.
Swedlow Plactics Co.
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Ryan Aeronautical Co.
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Bridgeport Brass Co.
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G. M. Dykes Iron Works, Inc.
General Cement Mfg. Co., Div.-Textron Inc.
La Pointe Industries Inc.
A. Y. McDonald Mfg. Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
True Alloys Inc.
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Springfield Brass Co.
Titan Metal Mfg. Co.
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Aerolite Electronics Corp.
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Continental Diamond Fibre Corp., Sub.-The Budd Co.
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Delta Chemical Works, Inc.
Division Lead Co.
Eagle-Picher Co., The
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Bram Metallurgical & Chemical Co.
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Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Clark Equipment Co.
Dale Products, Inc.
Dow Chemical Co., The
Dwyer Engrg. Co., Inc.
Electric Auto-Lite Co., The
Haynes Stellite Co., Div.-Union Carbide Corp.
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Lebanon Steel Foundry
Misco Precision Casting Co.
New York Air Brake Co., The, Watertown Div.
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Thompson Products, Inc.
Titan Metal Mfg. Co.
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Cooper Alloy Corp.
Crucible Steel Co. of America
Dale Products, Inc.
Electric Steel Foundry Co.
Lebanon Steel Foundry
Misco Precision Casting Co.
Perfecto Cast
Ray A. Scharer & Co.
Shenango Furnace Co., The, Centrifugally Cast Products Div.
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American Brake Shoe Co.
American Non Gran Bronze Co.
Ampco Metal, Inc.
Anchor Metal Co. Inc.
Bendix Foundries, Bendix Aviation Corp.
Celco-Constantine Engrg. Laboratories Co.
Dale Products, Inc.
Fischer & Porter Co.
New York Air Brake Co., The, Watertown Div.
Precision Castings, Inc.
True Alloys, Inc.
Ray A. Scharer & Co.
Shenango Furnace Co., The, Centrifugally Cast Products Div.

Die, Ferrous

American Car & Foundry Div., ACF Industries, Inc.
Dale Products, Inc.
Hart Metal Products Corp.

Die, Non-Ferrous

Aluminum Co. of America
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bendix Foundries, Bendix Aviation Corp.
Dale Products, Inc.
Dow Chemical Co., The
Hampden Brass & Aluminum Co.
Magline Inc.
P. R. Mallory & Co., Inc.
Sel-Rex Corp.
Titan Metal Mfg. Co.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Vibra Seal Corp.

Precision, Ferrous

Alloy Precision Castings Co.
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American Brake Shoe Co., Engineered Casting Div.
Arwood Precision Casting Corp.
Austenal Inc.
Champion Airquipment Inc.
Crucible Steel Co. of America
Dale Products, Inc.
Eaton Mfg. Co.
Haynes Stellite Co., Div.-Union Carbide Corp.
Hitchiner Mfg. Co., Inc.
Investment Casting Co.
Lebanon Steel Foundry
Mercast Mfg. Corp.
Misco Precision Casting Co.
New York Air Brake Co., The, Watertown Div.
Pacific Alloy Engrg. Corp.
Perfecto Cast
Rodney Metals Inc.
Sel-Rex Corp.
Thompson Products, Inc.
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Vibra Seal Corp.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.
*WESTINGHOUSE ELECTRIC CORP.

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Aluminum Co. of America
American Brake Shoe Co.
Anchor Metal Co., Inc.
Arwood Precision Casting Corp.
Austenal Inc.
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Bendix Foundries, Bendix Aviation Corp.
Bridgeport Brass Co.
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Hitchiner Mfg. Co., Inc.
Investment Casting Co.
Kemp Inc.
P. R. Mallory & Co., Inc.
Mercast Mfg. Corp.
National Research Corp.
New York Air Brake Co., The, Watertown Div.
Ohio Precision Castings, Inc.
Precision Castings, Inc.
True Alloys Inc.
Solon Foundry, Inc.
Springfield Brass Co.
Thompson Products, Inc.
United Shoe Machinery Corp.
Vibra Seal Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

Sand, Ferrous

Alloy Precision Castings Co.
American Brake Shoe Co.
American Brake Shoe Co., Engineered Casting Div.
American Car & Foundry Div., ACF Industries, Inc.
Challenge Machinery Co., The
Champion Airquipment Inc.
Clark Equipment Co.
Cooper Alloy Corp.
Crompton & Knowles Corp.
Crucible Steel Co. of America
Dale Products, Inc.
Electric Auto-Lite Co., The
Electric Steel Foundry Co.
General Railway Signal Co.
Indiana Foundry
Lebanon Steel Foundry
P. R. Mallory & Co., Inc.
New York Air Brake Co., The, Watertown Div.
Pacific Alloy Engrg. Corp.
Perfecto Cast
Ray A. Scharer & Co.
United Shoe Machinery Corp.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.

Sand, Non-Ferrous

Acme Brass & Foundry Co. of San Antonio, Inc.
Akron Brass Mfg. Co., Inc.
Al-Fin Div., Fairchild Engine & Airplane Corp.
Aluminum Alloys Corp.
Aluminum Co. of America
American Brake Shoe Co.
American Light Alloys, Inc.
American Non Gran Bronze Co.
Ampco Metal, Inc.
Bearium Metals Corp.
Bendix Foundries, Bendix Aviation Corp.
Bridgeport Brass Co.
Dayton Mfg. Co., Inc.
Dirilyte Co. of America, Inc.
Dow Chemical Co., The
Electric Auto-Lite Co., The
General Railway Signal Co.
Hampden Brass & Aluminum Co.
Haynes Stellite Co., Div.-Union Carbide Corp.
Hills-McCanna Co.
Indiana Foundry
Light Metals, Inc.
Magline Inc.
P. R. Mallory & Co., Inc.
A. Y. McDonald Mfg. Co.
New York Air Brake Co., The, Watertown Div.
Pettibone Mulliken Corp.
Precision Castings, Inc.
True Alloys Inc.
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Solon Foundry, Inc.
Springfield Brass Co.
United Shoe Machinery Corp.
Wayne Foundry & Stamping Co.
Wellman Bronze & Aluminum Co.
Wisconsin Aluminum Foundry Co., Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

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Anchor Packing Co., The
Connecticut Hard Rubber Co., The
Delta Chemical Works, Inc.
Emerson & Cuming, Inc.
General Cement Mfg. Co., Div.-Textron Inc.
Sauereisen Cements Co.
Swedlow Plastics Co.
X-Pando Corp.

Asbestos

Anchor Packing Co., The
Delta Chemical Works, Inc.
Eagle-Picher Co., The
Sauereisen Cements Co.
Union Asbestos & Rubber Co.
United Shoe Machinery Corp.

Pipe-Joint

Anchor Packing Co., The
Barium & Chemicals, Inc.
Samuel Cabot Inc.
Delta Chemical Works, Inc.
Eco Engrg. Co.
Flexrock Co.
Furane Plastics, Inc.
Johns-Mansville Dutch Brand Div.
Parker-Hannifin Corp.
Rubber & Asbestos Corp.
Sauereisen Cements Co.
Smooth-On Mfg. Co.
X-Pando Corp.

Plastic

Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avondale Co., The
Carl Biggs Co.
Samuel Cabot, Inc.
Delta Chemical Works, Inc.
Dennis Chemical Co.
Emerson & Cuming, Inc.
Flexrock Co.
General Cement Mfg. Co., Div.-Textron Inc.
B. F. Goodrich Industrial Products Co.
Hastings Plastics, Inc.
Lebec Chemical Corp.
Marblette Corp., The
Narmco Resins & Coatings Co.
New England Tape Co., Inc.
Rubber & Asbestos Corp.
Sauereisen Cements Co.
Smooth-On Mfg. Co.
Swedlow Plastics Co.
Topper Mfg. Co., Inc.
United Shoe Machinery Corp.

Rivet

Delta Chemical Works, Inc.
Walter K. Jaros, Aircrafters
Rubber & Asbestos Corp.

Rubber-To-Metal

Ambroid Co., Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avondale Co., The
Bloomingdale Rubber Co.
Connecticut Hard Rubber Co., The
*COOPER DEVELOPMENT CORP.
General Cement Mfg. Co., Div.-Textron Inc.
B. F. Goodrich Aviation Products
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
Johns-Mansville Dutch Brand Div.
Lebec Chemical Corp.
Marbon Chemical Div.-Borg-Warner Corp.
Narmco Resins & Coatings Co.
Rubber & Asbestos Corp.
Rubbercraft Corp. of California
Sauereisen Cements Co.
United Shoe Machinery Corp.
X-Pando Corp.

CERAMIC PARTS

Auburn Spark Plug Co., Inc.
B G Corp., The
Barium & Chemicals, Inc.
Bendix Products Div., Bendix Aviation Corp.
Bergen Carbide Co.
California Aircraft Products
Corning Glass Works
Delta Chemical Works, Inc.
Du-Co Ceramics Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Erie Resistor Corp.
General Ceramics Corp.
Hammett Electric Co.
Heldor Mfg. Co., Inc.
Walter J. Hyatt Co., The
Joclin Mfg. Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Litton Industries, Components Div.
Marquardt Aircraft Co.
Maryland Lava Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Morganite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
National Ceramic Co.
Norton Co.
Nuclear Corp. of America, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Saxonburg Ceramics
Size Control Co.
Solar Aircraft Co.
D. M. Steward Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Thermo Materials, Inc.
Topper Mfg. Co., Inc.
Zirconium Corp. of America

CERAMICS

Auburn Spark Plug Co., Inc.
B G Corp., The
Bendix Products Div., Bendix Aviation Corp.
Corning Glass Works
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Du-Co Ceramics Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Erie Resistor Corp.
Firth Sterling, Inc.
General Ceramics Corp.
Hammett Electric Co.
Heldor Mfg. Co., Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
Maryland Lava Co.
Metallurgical Products Dept., General Electric Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Morganite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
National Ceramic Co.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Patterson Foundry & Machine Co., The
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Saxonburg Ceramics
Solar Aircraft Co.
D. M. Steward Mfg. Co.
Thermo Materials, Inc.
Topper Mfg. Co., Inc.
Western Gold & Platinum
Zirconium Corp. of America

CESIUM

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Opelika Welding, Machine & Supply Inc.

CHASSIS, METAL

A&P Metal Products Mfg. Corp.
Abalon Precision Mfg. Corp.
Aerodex, Inc.
Aeronca Mfg. Corp.
Alden Products Co.
American Car & Foundry Div., ACF Industries, Inc.
Associated Co., Inc.
Bergen Carbide Co.
Clark Equipment Co.
*COOPER DEVELOPMENT CORP.
Dunlap Electronics, Inc.
G. M. Dykes Iron Works, Inc.
Eljay Corp.
Falstrom Co.
Heldor Mfg. Co., Inc.
Ludwig Honold Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
Lytle Engrg. & Mfg. Co.
Machine Engrg. Co., Inc.
Modglin Co., Inc.
Parish Pressed Steel, Div.-Dana Corp.
Paul & Beekman, Inc.
Peterson & Neville, Inc.
Philco Corp., Government & Industrial Divs.
Premier Metal Products Co.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
*RYAN INDUSTRIES
Schaffer Air Industries, Inc.
Suffolk Products Corp.
Stanley Aviation Corp.
Telectro Industries Corp.
Twix Mfg. Co., Inc.
Vector Electronic Co.
*WASHINGTON ALUMINUM CO., INC.
Warren Mfg. Div., Warren Brothers Roads Co.

CHEMICALS, DEHUMIDIFYING

Barium & Chemicals, Inc.
J. Bishop & Co. Platinum Works
Delta Chemical Works, Inc.
Dow Chemical Co., The
Driaire, Inc.
Merix Chemical Co.
John B. Moore Corp.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Science House, Inc.
Universal Dynamics Corp.
Wells Industries Corp.

CHEMICALS, ELECTROPLATING

Anachrome Corp.
Barium & Chemicals, Inc.

Bart Mfg. Corp.
Bergen Labs.
Delta Chemical Works, Inc.
Drilube Co.
Electric Auto-Lite Co., The
Fidelity Chemical Products Corp.
Mona Industries, Inc.
Nopco Chemical Co.
Sel-Rex Corp.
***WESTINGHOUSE ELECTRIC CO.**

CHROMIUM

Arens Controls, Inc.
Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Kerns Mfg. Corp.
Marman Div., Aeroquip Corp.

CLAMPS

Abalon Precision Mfg. Corp.
Aeroquip Corp.
American Brass Co., The
American Welding & Mfg. Co., The
Avica Corp.
Collins Engrg. Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Electric Auto-Lite Co., The
General Cement Mfg. Co., Div.-Textron Inc.
Hammett Electric Co.
Holub Industries, Inc.
Walter J. Hyatt Co., The
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Walter J. Hyatt Co., The
Joclin Mfg. Co.
Kerns Mfg. Corp.
Marco Industries Co.
National Utilities Corp.
Progressive Research & Development Co., Inc.
Skytronics
Specialty Products Corp.
Stewart-Warner Corp.
TA Mfg. Corp.
Tinnerman Products, Inc.
Titeflex, Inc.
Universal Metal Products, Inc.
Winder Aircraft Corp. of Fla.

Conduit

Amatom Electronic Hardware Co., Inc.
Arens Controls, Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dumont Aviation Associates
Hallett Mfg. Co.
Hammett Electric Co.
Holub Industries, Inc.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Marco Industries Co.
Rattan Mfg. Co., The
Servicair Co.
Sittler Corp.
Skytronics
TA Mfg. Corp.
Tinnerman Products, Inc.
Titeflex, Inc.
Universal Metal Products Inc.
Winder Aircraft Corp. of Fla.

Harness

Aerolite Electronics Corp.
Alden Products Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Burndy Corp., Omaton Div.
Capewell Mfg. Co.
Dayton Aircraft Products, Inc.
Electric Auto-Lite Co., The
Hallett Mfg. Co.
Hammett Electric Co.
Holub Industries, Inc.
Walter J. Hyatt Co., The
International Electric Industries, Inc.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Marman Div., Aeroquip Corp.
Servicair Co.
Skytronics
TA Mfg. Corp.
Tensor Electric Development Co., Inc.
Tinnerman Products, Inc.
Titeflex, Inc.
United Supply Co.
United-Carr Fastener Corp.
Universal Metal Products, Inc.
Wickfield, Inc.
Winder Aircraft Corp. of Fla.
Zippertubing Co., The

Hose

Aeroquip Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Burndy Corp., Omaton Div.
California Aircraft Products
Continental Rubber Works
Devilbiss Co., The
Dumont Aviation Associates
Eaton Mfg. Co.
General R-F Fittings, Inc.
Horst Engrg. & Mfg. Co.
Walter J. Hyatt Co., The
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Rodney Metals, Inc.
Specialty Products Corp.
TA Mfg. Corp.
Tinnerman Products, Inc.
Titeflex, Inc.
United Supply Co.
Winder Aircraft Corp. of Fla.

Mechanical Cable

Accurate Electronics Corp., Dept D
Arens Controls, Inc.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Electric Auto-Lite Co., The
Hammett Electric Co.
Holub Industries, Inc.
Joclin Mfg. Co.
Kulka Electric Corp.
Marman Div., Aeroquip Corp.
Pyle-National Co., The
Reid Metal Products, Inc.
TA Mfg. Corp.
Tinnerman Products, Inc.
Titeflex, Inc.
Universal Metal Products, Inc.
Winder Aircraft Corp. of Fla.

Special

Abalon Precision Mfg. Corp.
Aeroquip Corp.
American Welding & Mfg. Co., The
D. S. D. Mfg. Co., The
G. M. Dykes Iron Works, Inc.
Elm Mfg. Co., Inc.
Hammett Electric Co.
Walter J. Hyatt Co., The
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Joclin Mfg. Co.
Kerns Mfg. Corp.
Marman Div., Aeroquip Corp.
Peerless Electronics, Inc.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Smith-Morris Corp.
Specialty Products Corp.
TA Mfg. Corp.
Tinnerman Products, Inc.
Titeflex, Inc.
United Mfg. Co., The
Universal Metal Products, Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Western Arc Welding, Inc.
Winder Aircraft Corp. of Fla.
Wollam Aircraft & Marine Products Co.

Tube

Aeroquip Corp.
American Welding & Mfg. Co., The
Augat Brothers, Inc.
Avica Corp.
Birnbach Radio Co., Inc.
Corbin Products Div.
D. S. D. Mfg. Co., The
Dumont Aviation Associates
Horst Engrg. & Mfg. Co.
Walter J. Hyatt Co., The
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Joclin Mfg. Co.
Kerns Mfg. Corp.
Peerless Electronics, Inc.
TA Mfg. Corp.
Tensor Electric Development Co., Inc.
Tinnerman Products, Inc.
Titeflex, Inc.
Universal Metal Products, Inc.
Western Arc Welding, Inc.
Winder Aircraft Corp. of Fla.

CLIPS, CONDUIT

American Brass Co., The
Carroll Pressed Metal, Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dumont Aviation Associates
Hallett Mfg. Co.
Hammett Electric Co.
Walter J. Hyatt Co., The
International Electric Industries, Inc.
***LAMINATED SHIM CO.**
Walter K. Jaros, Aircrafters
Servicair Co.
Skytronics
TA Mfg. Corp.
Tensor Electric Development Co., Inc.
Titeflex, Inc.
Universal Metal Products, Inc.

CLIPS, SPECIAL

Accurate Electronics Corp., Dept D
American Brass Co., The
Atlas E-E Corp.
Birnbach Radio Co., Inc.
H. Braun Tool & Instrument Co., Inc.
Carroll Pressed Metal, Inc.
Dakota Engrg., Inc.
Dumont Aviation Associates
G. M. Dykes Iron Works, Inc.
Garde Mfg. Co.
Heldor Mfg. Co., Inc.
Hunter Spring Co.
Walter J. Hyatt Co., The
International Electric Industries, Inc.
Walter K. Jaros, Aircrafters
Keystone Electronics Corp.
***LAMINATED SHIM CO.**
Pacific Cut Washer Co.
Rodney Metals, Inc.
Ryan Aeronautical Co.
Skytronics
TA Mfg. Corp.
Tensor Electric Development Co., Inc.
Tinnerman Products, Inc.
United-Carr Fastener Corp.
Universal Metal Products, Inc.

CLIPS, SPRING

American Brass Co., The
Arens Controls, Inc.
Atlas E-E Corp.
Augat Brothers, Inc.
H. Braun Tool & Instrument Co., Inc.
Garde Mfg. Co.
Gasket, Packing & Specialty Co., Inc.
General Cement Mfg. Co., Div.-Textron Inc.
Hunter Spring Co.
Walter K. Jaros, Aircrafters
***LAMINATED SHIM CO.**
Pacific Cut Washer Co.
Rodney Metals Inc.
Star Engraving Co., Ltd.
TA Mfg. Corp.
Tinnerman Products, Inc.
United-Carr Fastener Corp.
Universal Metal Products Inc.

CLIPS, TUBE

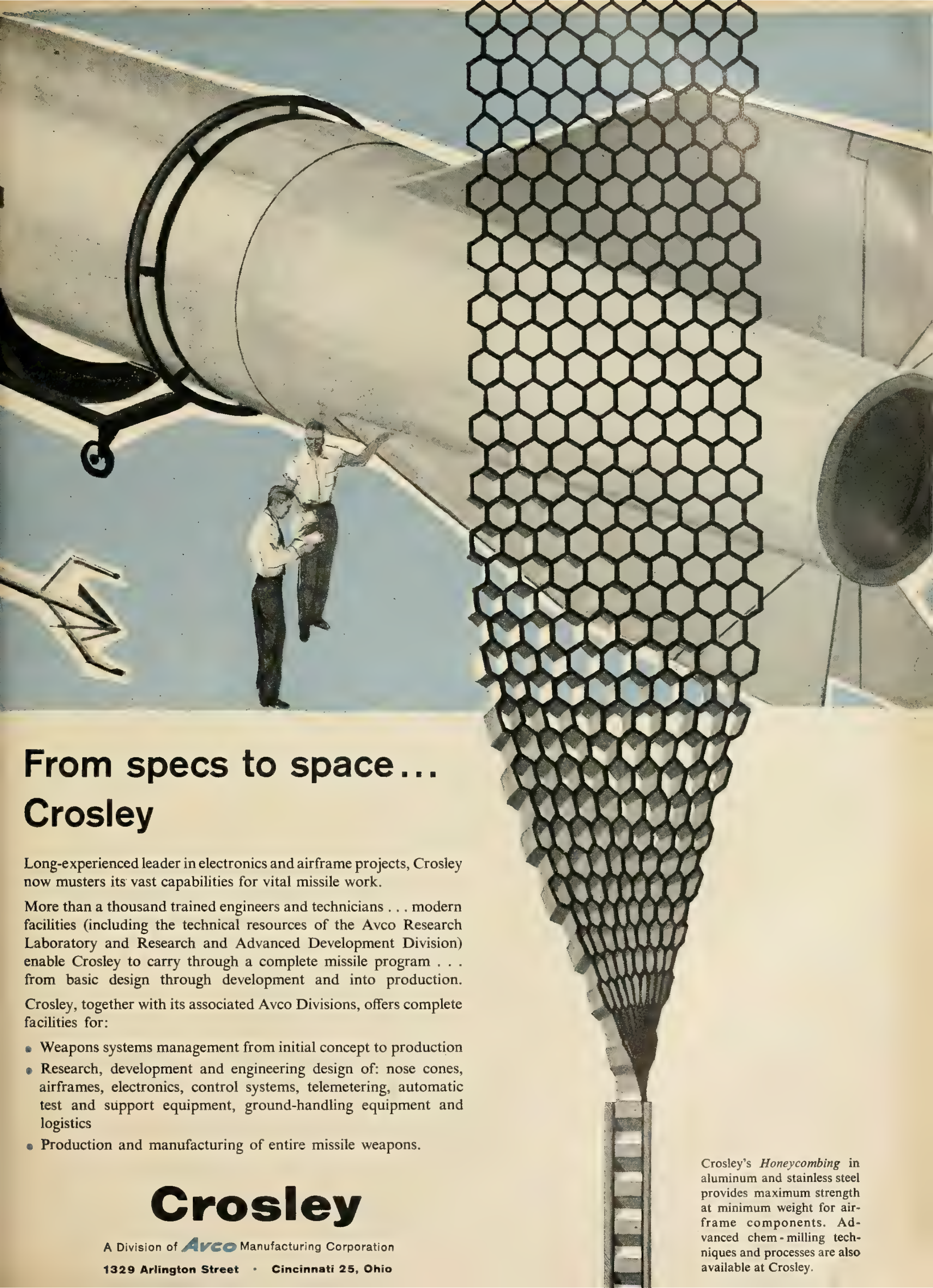
American Brass Co., The
Atlas E-E Corp.
Augat Brothers, Inc.
Avica Corp.
Birnbach Radio Co., Inc.
H. Braun Tool & Instrument Co., Inc.
Corbin Products Div.
Dumont Aviation Associates
Hobson Brothers, Inc.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
Kolton Electric Mfg. Co.
Kulka Electric Corp.
***LAMINATED SHIM CO.**
Parker-Hannifin Corp.
Star Engraving Co., Ltd.
Tinnerman Products, Inc.
United-Carr Fastener Corp.
Universal Metal Products Inc.
Vemaline Products Co.

CLOTH, GLASS

Allied Plastics Supply Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Atlas Asbestos Co.
Bar-Ray Products, Inc.
C. R. Daniels, Inc.
Duracote Corp.
General Plastics Corp. of New Jersey
Hastings Plastics Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
William W. Stanley Co. Inc.
Wagner Awning & Mfg. Co., The

CLOTH, PLASTIC

Allied Plastics Supply Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Cordo Molding Products, Inc.
C. R. Daniels, Inc.
Duracote Corp.
Furane Plastics, Inc.
General Cement Mfg. Co., Div.-Textron Inc.
General Plastics Corp. of New Jersey
Horsey, Robson & Co., Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
M. L. Snyder & Son, Inc.
William W. Stanley Co. Inc.
Swedlow Plastics Co.
Zippertubing Co., The



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Long-experienced leader in electronics and airframe projects, Crosley now musters its vast capabilities for vital missile work.

More than a thousand trained engineers and technicians . . . modern facilities (including the technical resources of the Avco Research Laboratory and Research and Advanced Development Division) enable Crosley to carry through a complete missile program . . . from basic design through development and into production.

Crosley, together with its associated Avco Divisions, offers complete facilities for:

- Weapons systems management from initial concept to production
- Research, development and engineering design of: nose cones, airframes, electronics, control systems, telemetering, automatic test and support equipment, ground-handling equipment and logistics
- Production and manufacturing of entire missile weapons.

Crosley

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Crosley's *Honeycombing* in aluminum and stainless steel provides maximum strength at minimum weight for airframe components. Advanced chem-milling techniques and processes are also available at Crosley.

CLOTH, RUBBERIZED

Allied Plastics Supply Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
J. Bishop & Co. Platinum Works
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
C. R. Daniels, Inc.
B. F. Goodrich Aviation Products
Reeves Brothers Inc., Vulcan Rubber Products Div.
Rubbercraft Corp. of California
M. L. Snyder & Son, Inc.

CLOTHS, WOVEN WIRE

Blaco Mfg. Co.
Cambridge Wire Cloth Co., The
Chase Brass & Copper Co., Inc.
Flock Process Co. Inc.
General Cable Corp.
General Cement Mfg. Co., Div.-Textron Inc.
National-Standard Co.
Newark Wire Cloth Co.
Schlegel Mfg. Co.

COATINGS

Acheson Colloids Co., Div.-Acheson Industries, Inc.
American Agile Corp.
American Cord & Webbing Co., Inc.
Anadite Inc.
Avondale Co., The
Connecticut Hard Rubber Co., The
Consolidated Electrodynamics Corp.
Crown Industrial Products Co.
Delta Chemical Works, Inc.
Dennis Chemical Co.
Duracote Corp.
Fidelity Chemical Products Corp.
Fluorocarbon Co. Inc., The
General Cement Mfg. Co., Div.-Textron Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Industrial Metal Protectives, Inc.
Kano Labs.
Linde Co., Div.-Union Carbide
Marblette Corp., The
Merix Chemical Co.
Norton Co.
Raybestos-Manhattan, Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Seal-Peel, Inc.
Silicones Div.-Union Carbide Corp.
L. Sonneborn & Sons, Inc., Building Products Div.
Swedlow Plastics Co.
Topper Mfg. Co., Inc.
Tube Reducing Corp.
Western Coating Co.

Finishing

American Agile Corp.
American Cord & Webbing Co., Inc.
Anachrome Corp.
Anadite Inc.
Avondale Co., The
Carl Biggs Co.
***COOPER DEVELOPMENT CORP.**
Delta Chemical Works, Inc.
Dennis Chemical Co.
Drilube Co.
Duracote Corp.
Fidelity Chemical Products Corp.
Flock Process Co. Inc.
Fluorocarbon Co. Inc., The
Linde Co., Div.-Union Carbide
Marblette Corp., The
Merix Chemical Co.
Rodney Metals Inc.
L. Sonneborn & Sons, Inc., Building Products Div.
Vorac Co., The

High Temperature

Acheson Colloids Co., Div.-Acheson Industries, Inc.
American Agile Corp.
American Cord & Webbing Co., Inc.
Anadite Inc.
Auto-Control Labs., Inc.
Avondale Co., The
Bart Mfg. Corp.
Carl Biggs Co.
Connecticut Hard Rubber Co., The
Consolidated Electrodynamics Corp.
Delta Chemical Works, Inc.
Drilube Co.
Duracote Corp.
Eagle-Picher Co., The
Electrofilm, Inc.
Emerson & Cuming, Inc.
Fidelity Chemical Products Corp.
Firth Sterling Inc.
Fluorocarbon Co. Inc., The
Furane Plastics, Inc.
General Cement Mfg. Co., Div.-Textron Inc.
General Plastics Corp. of New Jersey
Gulton Industries, Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Industrial Metal Protectives, Inc.
Joclin Mfg. Co.
Lebec Chemical Corp.
Linde Co., Div.-Union Carbide
London Chemical Co., Inc.
Marblette Corp., The
Narmco Resins & Coatings Co.
National Research Corp.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Swedlow Plastics Co.
Arthur Tickle Engrg. Works, Inc.
United Shoe Machinery Corp.
Vorac Co., The
Warren Wire Co.
Zirconium Corp. of America

Protective

Amercoat Corp.
American Agile Corp.
American Cord & Webbing Co., Inc.
American Solder & Flux Co.
Anachrome Corp.
Anadite Inc.
Arco Co., The
Avondale Co., The
Carl Biggs Co.
Connecticut Hard Rubber Co., The
Cordo Molding Products, Inc.
Crown Industrial Products Co.
Dayton Aircraft Products, Inc.
Delta Chemical Works, Inc.
Dennis Chemical Co.
Drilube Co.
Duracote Corp.
Eagle-Picher Co., The
Electrofilm, Inc.
Emerson & Cuming, Inc.
Engineered Plastics, Inc.
Esso Standard Oil Co.
Fidelity Chemical Products Corp.
Furane Plastics, Inc.
General Plastics Corp. of New Jersey
B. F. Goodrich Industrial Products Co.
Horsey, Robson & Co., Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Industrial Metal Protectives, Inc.
Joclin Mfg. Co.
Kano Labs.
Kelsey-Hayes Co.
Krylon, Inc.
Lebec Chemical Corp.
Linde Co., Div.-Union Carbide
London Chemical Co., Inc.
Marblette Corp., The
Merix Chemical Co.
Narmco Resins & Coatings Co.
National Research Corp.
New England Tape Co. Inc.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Opelika Welding, Machine, & Supply Inc.
Raybestos-Manhattan, Inc.
Seal-Peel, Inc.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Sparta Mfg. Co.
Topper Mfg. Co., Inc.
Turco Products, Inc.
Vorac Co., The
Waldom Electronics Inc.
Western Coating Co.
White & Bagley Co., The
X-Pando Corp.

SALT SPRAY RESISTANCE

Aerodex, Inc.
American Agile Corp.
Anadite Inc.
Auto-Control Labs., Inc.
Avondale Co., The
Carl Biggs Co.
Crown Industrial Products Co.
Dennis Chemical Co.
Electrofilm, Inc.
General Plastics Corp. of New Jersey
B. F. Goodrich Industrial Products Co.
Industrial Metal Protectives, Inc.
Kelsey-Hayes Co.
London Chemical Co., Inc.
Marblette Corp., The
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
Telectro Industries Corp.
Tube Reducing Corp.
Turco Products, Inc.
Vorac Co., The
Westline Products Div., Western Lithograph Co.

COBALT

Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.

COLUMBIUM METALS

American Silver Co.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Fansteel Metallurgical Corp.
Kennametal Inc.
National Research Corp.
Wallingford Steel Co.

COMBUSTION CHAMBER COVERS

Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Hicks Corp., The
Hupp Aviation Co.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
***LYCOMING DIV., AVCO MFG. CORP.**
Misco Precision Casting Co.
Oerlikon Tool & Arms Corp. of America
Parish Pressed Steel, Div.-Dana Corp.
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
Twix Mfg. Co., Inc.
United Mfg. Co., The
Universal Machine Co., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
Wright Aeronautical Div., Curtiss-Wright Corp.

COMBUSTION CHAMBER LINERS

Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Frederic Flader Div.
Hicks Corp., The
Hupp Aviation Co.
***IDEAL CHEMICAL PRODUCTS, INC.**
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
***LYCOMING DIV., AVCO MFG. CORP.**
Marquardt Aircraft Co.
Norton Co.
Oerlikon Tool & Arms Corp. of America
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
Universal Machine Co., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

COMPOUNDS

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Anchor Metal Co. Inc.
Avondale Co., The
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Duracote Corp.
Electrofilm, Inc.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
B. F. Goodrich Industrial Products Co.
Merix Chemical Co.
National Engrg. Products, Inc.
Sauereisen Cements Co.
Silicones Div.-Union Carbide Corp.
L. Sonneborn & Sons, Inc., Building Products Div.
Topper Mfg. Co., Inc.
Wye Industries
X-Pando Corp.

Calking and Sealing

Anchor Metal Co. Inc.
Arco Co., The
Avondale Co., The
Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Emerson & Cuming, Inc.
Flock Process Co. Inc.
B. F. Goodrich Aviation Products
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
Marblette Corp., The
National Engrg. Products, Inc.
Parker-Hannifin Corp.
Sauereisen Cements Co.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.

Smooth-On Mfg. Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Topper Mfg. Co., Inc.
United Shoe Machinery Corp.
X-Pando Corp.

Electrical Insulating and Sealing

Allied Plastics Supply Corp.
Aries Laboratories, Inc.
Avondale Co., The
Carl Biggs Co.
Bios Labs., Inc.
Biwax Corp.
Duracote Corp.
Emerson & Cuming, Inc.
Hastings Plastics Inc.
*IDEAL CHEMICAL PRODUCTS, INC.
Joclin Mfg. Co.
Lehigh Chemical Co.
Marblette Corp., The
National Engrg. Products, Inc.
New England Tape Co. Inc.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Sauereisen Cements Co.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Smooth-On Mfg. Co.
Topper Mfg. Co., Inc.
United Shoe Machinery Corp.

Encapsulation

Airflyte Electronics Co.
Aries Laboratories, Inc.
Bacon Industries, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Biwax Corp.
Emerson & Cuming, Inc.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Hastings Plastics Inc.
*IDEAL CHEMICAL PRODUCTS, INC.
Marblette Corp., The
New England Tape Co. Inc.
Nopco Chemical Co.
Reichhold Chemicals, Inc.
Ryan Aeronautical Co.
Sauereisen Cements Co.
Shell Chemical Corp.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Smooth-On Mfg. Co.
Star Engraving Co., Ltd.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Topper Mfg. Co., Inc.

Impregnating

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Aries Laboratories, Inc.
Avondale Co., The
Bacon Industries, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Biwax Corp.
Cordo Molding Products, Inc.
Duracote Corp.
Emerson & Cuming, Inc.
B. F. Goodrich Industrial Products Co.
Graflex, Inc.
Hastings Plastics Inc.
Lebec Chemical Corp.
Magnetic Shield Div.-Perfection Mica Co.
Marblette Corp., The
Narmco Resins & Coatings Co.
New England Tape Co. Inc.
Reichhold Chemicals, Inc.
Ryan Aeronautical Co.
Sauereisen Cements Co.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Topper Mfg. Co., Inc.

Mica

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Brush Beryllium Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Electronic Mechanics, Inc.
Marblette Corp., The
Mica Fabricating Co.
Mycalex Corp. of America
Silicones Div.-Union Carbide Corp.

PHENOLIC MOLDING

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Bios Labs., Inc.
Biwax Corp.
Coast Mfg. & Supply Co.
Dayton Aircraft Products, Inc.
Hastings Plastics Inc.
Joclin Mfg. Co.
Marblette Corp., The
Mica Fabricating Co.
Pacific Moulded Products Co.
Reichhold Chemicals, Inc.
Rogers Corp.
Sauereisen Cements Co.
Science House, Inc.
Silicones Div.-Union Carbide Corp.

POTTING

Aries Laboratories, Inc.
Avondale Co., The
Bacon Industries, Inc.
Barium & Chemicals, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Biwax Corp.
Dennis Chemical Co.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
B. F. Goodrich Aviation Products
Hastings Plastics Inc.
Lebec Chemical Corp.
Lehigh Chemical Co.
Magnetic Shield Div.-Perfection Mica Co.
Marblette Corp., The
Narmco Resins & Coatings Co.
New England Tape Co. Inc.
Nopco Chemical Co.
Ryan Aeronautical Co.
Shell Chemical Corp.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Smooth-On Mfg. Co.
Topper Mfg. Co., Inc.

WATERPROOFING

Arco Co., The
Carl Biggs Co.
Bios Labs., Inc.
Biwax Corp.
Dennis Chemical Co.
Duracote Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
Horsey, Robson & Co., Inc.
Lebec Chemical Corp.
London Chemical Co., Inc.
Marblette Corp., The
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Smooth-On Mfg. Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Topper Mfg. Co., Inc.
Trio Chemical Works, Inc.
United Shoe Machinery Corp.
X-Pando Corp.

COMPUTERS, AIR DATA

Alwac Corp.
American Electronics, Inc., Data-Tronics Div.
*AMERICAN MACHINE & FOUNDRY CO.
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Bendix Products Div., Bendix Aviation Corp.
Briggs Associates, Inc.
CDC Control Services, Inc.
Consolidated Avionics Corp.
Consolidated Controls Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
*WALLACE O. LEONARD, INC.
Librascope Inc.
Lytle Engrg. & Mfg. Co.
J. A. Maurer, Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Reflectone Corp., The
Republic Aviation Corp., Guided Missiles Div.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Stanley Aviation Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
M. Ten Bosch, Inc.
United Control Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

CONDUITS, IGNITION WIRE

American Brass Co., American Metal Hose Div.
Co-Operative Industries, Inc.
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Hallett Mfg. Co.
Hammett Electric Co.
Johnson Metal Hose, Inc.
Marco Industries Co.
J. E. Menaugh Co.
Servicair Co.
Skytronics
Titeflex, Inc.
Zippertubing Co., The

CONDUITS, METAL

Aluminum Co. of America
American Brass Co., The
American Brass Co., American Metal Hose Div.
*AMERICAN TUBE BENDING CO., INC.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Blaco Mfg. Co.
Co-Operative Industries, Inc.
D K Mfg. Co.
Electric Auto-Lite Co., The
Federal Metal Hose Corp.
Flexible Metal Hose Mfg. Co.
General Cable Corp.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Standard Metals Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of Amreica
Zippertubing Co., The

CONES, METAL

American Brass Co., The
American Car & Foundry Div., ACF Industries, Inc.
American Welding & Mfg. Co., The
Associated Co., Inc.
California Aircraft Products
*COOPER DEVELOPMENT CORP.
Cuno Engrg. Corp., The
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Hammett Electric Co.
A. F. Holden Co., The
Ludwig Honold Mfg. Co.
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kling Metal Spinning & Stamping Co.
Ladish Co.
La Pointe Industries Inc.
*LAVELLE AIRCRAFT CORP.
Longren Aircraft Co., Inc.
*LYCOMING DIV., AVCO MFG. CORP.
Magnetic Shield Div.-Perfection Mica Co.
Henry & Miller Industries, Inc.
Penn-Michigan Mfg. Corp.
Peterson & Neville Inc.
*PHOENIX PRODUCTS CO.
Pressed Steel Tank Co.
Republic Aviation Corp., Guided Missiles Div.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
Size Control Co.
Solar Aircraft Co.
Superior Spinning & Stamping Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

CONNECTORS

(Hermetic, multi-pin, umbilical)

*ANTON ELECTRONIC LABS., INC.

CONTROLS, HEAT TREATING

CDC Control Services, Inc.
Devco Engrg. Inc.
Electric Auto-Lite Co., The
Electronic Control Corp.
Electronics Corp. of America
Fenwal Inc.
Hagan Chemicals & Controls, Inc.
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
Rodney Metals Inc.

CONTROLS, MATERIAL THICKNESS

CDC Control Services, Inc.
Electronic Control Corp.
Nuclear Corp. of America, Inc.
Photobell Co., Inc.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Size Control Co.

CONTROLS, STRAIN

CDC Control Services, Inc.
Cal-Ohm Labs., Inc.
Columbia Research Labs.
Consolidated Avionics Corp.
Electronics Corp. of America
Hallamore Electronics Co.

CONTROLS, SURFACE FINISH

Brush Instruments, Div.-Clevite Corp.
Chester Cable Corp.
Cleveland Instrument Co.
General Electric Co., Apparatus Sales Div.
Size Control Co.

COPPER

American Brake Shoe Co.
American Brass Co., The
American Silver Co.
Anchor Metal Co. Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
Consolidated Wire & Associated Companies
Delta Chemical Works, Inc.
G. M. Dykes Iron Works, Inc.
Fromson Orban Co., Inc.
National Copper & Smelting Co.
Revere Copper & Brass Inc.
Sel-Rex Corp.
Springfield Brass Co.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America
Wisconsin Aluminum Foundry Co., Inc.

CORDS, SHOCK

Aerotec Corp., The
American Cord & Webbing Co., Inc.
C. R. Daniels, Inc.
Walter K. Jaros, Aircrafters
Rubbercraft Corp. of California
Security Parachute Co.
United Supply Co.

CORDS, RETRACTILE

General Cable Corp.
International Electric Industries, In
Koiled Kords Inc.
Rex Corp., The

CORDS, PATCH

AMP Inc.
Aerolite Electronics Corp.
Alden Systems Co.
American Super-Temperature Wires, Inc.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
J. H. Bunnell & Co.
Coaxial Connector Co. Inc.
Consolidated Wire & Associated Companies
Dunlap Electronics, Inc.
Hammett Electric Co.
Lenkurt Electric Co., Inc.
Pomona Electronics Co., Inc.
Richards Electrocraft, Inc.
Vector Electronic Co.
Western International Co.

CORK

Armstrong Cork Co.
Auburn Mfg. Co., The
Darcoid Co., Inc., The
Delta Chemical Works, Inc.
Duroyd Gasket Mfg. Co.
General Gasket Inc.

DECALCOMANIAS

Dunlap Electronics, Inc.
Norsid Mfg. Co., Inc., The
Meyercord Corp.
Meyercord Co., The, AMC Div.
Sohl Co., The
Star Engraving Co., Ltd.
E. F. Twomey Co., Inc.
Westline Products Div., Western Lithograph Co.

DIE CASTINGS

Aluminum Co. of America
American Car & Foundry Div., ACF Industries Inc.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bendix Foundries, Bendix Aviation Corp.
Bendix Products Div., Bendix Aviation Corp.
Bridgeport Brass Co.
Dale Products, Inc.
Dow Chemical Co., The
Electric Auto-Lite Co., The
Hampden Brass & Aluminum Co.
Ray A. Scharer & Co.
Sel-Rex Corp.
Stewart-Warner Corp.
Titan Metal Mfg. Co.

DIES

Abalon Precision Mfg. Corp.
Allied Engraving & Stamping Co.
Amatom Electronic Hardware Co. Inc.
American Car & Foundry Div., ACF Industries Inc.
Basic Tool Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
Bergen Carbide Co.
G. M. Dykes Iron Works, Inc.
Electric Auto-Lite Co., The
Electronic Techniques, Inc.
Greenfield Tap & Die Corp.
Walter K. Jaros, Aircrafters
Metal Carbides Corp.
Metal Masters, Inc.
Henry & Miller Industries, Inc.
Pacific Cut Washer Co.
Paul & Beekman, Inc.
Progressive Research & Development Co., Inc.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Springcraft, Inc.
Technical Oil Tool Corp.
Thompson Products, Inc.
Twix Mfg. Co., Inc.
Wales Strippit Co., Unit of Houdaille Industries, Inc.
Western Arc Welding, Inc.
Wickfield, Inc.

DOWELS

Acme Industrial Co.
American Standard Products, Inc.
Danly Machine Specialties, Inc.
*HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.
Walter K. Jaros, Aircrafters
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Standard Pressed Steel Co.
Warren Mfg. Div., Warren Brothers Roads Co.
Westlake Plastics, CrystalX Corp.

DROP FORGINGS

Aircraft Mechanics, Inc.
Aluminum Co. of America
American Brake Shoe Co.
American Car & Foundry Div., ACF Industries, Inc.
American Steel Foundries, Hammond Div.
American Welding & Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
*BILLINGS & SPENCER CO., THE
*CAMERON IRON WORKS, INC.
Capewell Mfg. Co.
Corbin Products Div.
Crucible Steel Co. of America
G. M. Dykes Iron Works, Inc.
Endicott Forging & Mfg. Co., Inc.
General Railway Signal Co.
General Sound Control, Inc.
Hart Metal Products Corp.
Walter K. Jaros, Aircrafters
Kellett Aircraft Corp.
Kelsey-Hayes Co.
Ladish Co.
Modglin Co. Inc.
Pettibone Mulliken Corp.
H. K. Porter Inc.
Ray A. Scharer & Co.
Steel Improvement & Forge Co., The
Thompson Products, Inc.
Transue & Williams Steel Forging Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Vlchek Tool Co., The
*WESTINGHOUSE ELECTRIC CORP.
J. H. Williams Co.

DUCTS, EXHAUST

ACF Industries, Inc., Advanced Products Div.
Aircraft Mechanics, Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Aerophysics Corp.
American Brass Co., American Metal Hose Div.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Associated Co., Inc.
Avica Corp.
Basic Tool Industries, Inc.
Beaton & Corbin Mfg. Co., The
California Aircraft Products
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
*DIVERSEY ENGRG. CO
G. M. Dykes Iron Works, Inc.
Flexonics Corp.
General Sound Control, Inc.
Houston Fearless Corp.
Hupp Aviation Co.
Kelsey-Hayes Co.
Henry & Miller Industries, Inc.
Modglin Co. Inc.
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works Inc.
Republic Aviation Corp., Guided Missiles Div.
Rodney Metals Inc.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Seamless Products Co., Inc.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
Twin Coach Co.—Aircraft Div.
Warren Mfg. Div., Warren Brothers Roads Co.
Weber Aircraft Corp.
Western Arc Welding, Inc.
Woolf Aircraft Products, Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

DUCTS, FLEXIBLE AND COMPRESSIBLE

Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Basic Tool Industries, Inc.
Blowers Inc.
California Aircraft Products
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp. Sub.—The Budd Co.
D K Mfg. Co.
C. R. Daniels, Inc.
G. M. Dykes Iron Works, Inc.
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Houston Fearless Corp.
Kellett Aircraft Corp.
*LONE STAR PLASTICS CO. INC.
Modglin Co. Inc.
Rodney Metals Inc.
Rohr Aircraft Corp.
Rubbercraft Corp. of California
Solar Aircraft Co.
Stainless Steel Products, Inc.
TA Mfg. Corp.
Thieblot Aviation Co., Div.—Vitro Corp. of America
Thompson Products, Inc.
Wagner Awning & Mfg. Co., The
Winder Aircraft Corp. of Fla.

DUCTS, NON-FLEXIBLE

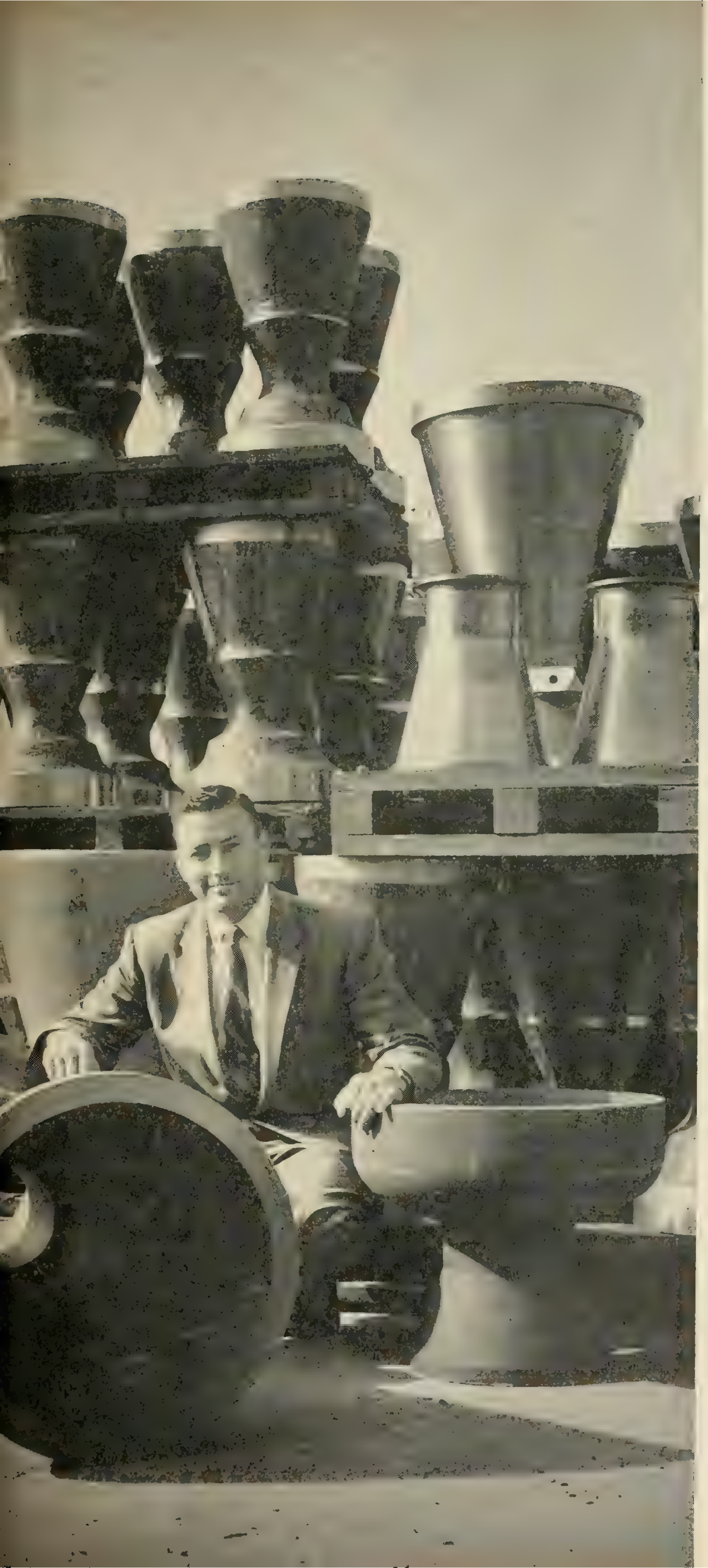
ACF Industries, Inc., Advanced Products Div.
Aircraft Mechanics, Inc.
American Aerophysics Corp.
*AMERICAN TUBE BENDING CO., INC.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Associated Co., Inc.
Basic Tool Industries, Inc.
Beaton & Corbin Mfg. Co., The
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
G. M. Dykes Iron Works, Inc.
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
General Cable Corp.
Hart Metal Prdoucts Corp.
Ludwig Honold Mfg. Co.
Houston Fearless Corp.
Huber Industries, Inc.
Lamtex Industries, Inc.
*LAVELLE AIRCRAFT CORP.
Modglin Co., Inc.
Penn-Michigan Mfg. Corp.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Southwest Products Co.
Stainless Steel Products, Inc.
Thieblot Aviation Co., Div.—Vitro Corp. of America
Thompson Products, Inc.
Turbo Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Warren Mfg. Div., Warren Brothers Roads Co.
Wayne Foundry & Stamping Co.
Weber Aircraft Corp.
Winder Aircraft Corp. of Fla.

EJECTION SYSTEMS

Aerotex Corp., The
Aircraft Armaments, Inc.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Beckman & Whitley, Inc., Missile Products Div.
G. M. Dykes Iron Works, Inc.
Gray & Huleguard, Inc.
Huber Industries, Inc.
McCormick Selph Associates
O & M Machine Co., Inc.
Propellex Chemical Corp.
Republic Aviation Corp., Guided Missiles Div.
Royal Industries, Inc.
Ryan Aeronautical Co.
Security Parachute Co.
Standard Armament Inc.
Stanley Aviation Corp.
Talco Engrg. Co., The
Technical Oil Tool Corp.
Weber Aircraft Corp.
Winchester—West. Div.—Olin Mathieson Chem. Corp.

ELECTROPLATING EQUIPMENT

Bergen Labs.
Electric Auto-Lite Co., The
Green Rectifier Co.
Hammett Electric Co.
George L. Nankervis Co.
Opad Electric Co.
Sel-Rex Corp.
Titanium Metals Corp. of America
Uniwave, Inc.
*WESTINGHOUSE ELECTRIC CORP.

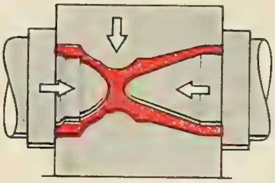


NO WONDER WE MAKE SO MANY

CAMERON ONE PIECE FORGED MISSILE NOZZLES

1. Have no welds
2. Require less machining
3. Are lower in cost

A better nozzle for less money has put Cameron way ahead in production of these important missile parts. Cameron's exclusive split-die forging process makes this possible. Each nozzle is forged from a single heated billet of specified steel. This steel is produced in Cameron's own melt shop under the closest possible control. From these perfect billets our specially designed split-die presses forge a near final shape.



Movement of the three elements in the split-die process.

No welds are required and machining is greatly simplified—grain structures are perfect.

Missile nozzles produced by this method are supplied as finished forgings ready for economical machining or completely machined to specification. At every single phase of manufacture, each nozzle is checked by the most modern methods used today.

The Cameron split-die process has successfully solved many unusual forging problems in a wide variety of end uses. Some of these include critical airframe members, jet engine components, propeller blades and hubs, atomic reactor valves and many high pressure controls for the oil industry.

Cameron has extended the great advantage of ferrous forged members to include shapes impossible to produce heretofore. Present production of missile nozzles includes diameters to 28″ with large open sections and elongated double conical thin sections to 36″ in length. In weight our forgings range to 8,000 lbs. and our high quality alloys satisfy many unusual demands. If you need forgings in this group and, of course, if you need nozzles, call, write or come by . . .

Cameron
IRON WORKS, Inc.
SPECIAL PRODUCTS DEPARTMENT
P. O. Box 1212, Houston, Texas

EMBEDDED ASSEMBLIES

Aerolite Electronics Corp.
Airflyte Electronics Co.
Allied Engraving & Stamping Co.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Cal-Ohm Labs., Inc.
***COOPER DEVELOPMENT CORP.**
Dale Products, Inc.
Daystrom Instrument Div., Daystrom, Inc.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Electronic Techniques, Inc.
Electronics Corp. of America
Elgin Micronics, West Coast Div.—Elgin National Watch Co.
Emerson & Cuming, Inc.
Jodee Plastics Co.
La Pointe Industries Inc.
National Coil Co.
Precision, Inc.
Sohl Co., The
Telectro Industries Corp.
Tempo Instrument Inc.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
Uniwave Inc.
Warren Transformer Co., Inc.

EMBEDDED COMPONENTS

Aerolite Electronics Corp.
Airflyte Electronics Co.
Allied Engraving & Stamping Co.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Cal-Ohm Labs., Inc.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Electronic Techniques, Inc.
Electronics Corp. of America
Emerson & Cuming, Inc.
Furane Plastics, Inc.
Jodee Plastics Co.
La Pointe Industries Inc.
National Coil Co.
Precision, Inc.
Sohl Co., The
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Tresco, Inc.
Tucson Instrument Corp.
Ultradyne, Inc.
Warren Transformer Co., Inc.

EXTRUSIONS, METALLIC

Aluminum Co. of America
American Brass Co., The
American Car & Foundry Div., ACF Industries, Inc.
Ampco Metal, Inc.
Anchor Metal Co. Inc.
Babcock & Wilcox Co. Tubular Products Div.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Delta Chemical Works, Inc.
Division Lead Co.
Dow Chemical Co., The
Eagle-Picher Co., The
Fromson Orban Co., Inc.
Harvey Aluminum
Kaiser Aluminum & Chemical Sales, Inc.
Kelsey-Hayes Co.
Ladish Co.
La Pointe Industries Inc.
Pioneer Aluminum Inc.
Revere Copper & Brass Inc.
Titan Metal Mfg. Co.
Titanium Metals Corp. of America
Turbo Dynamics Corp.
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
***R. D. WERNER CO. INC.**
Winchester—West. Div.—Olin Mathieson Chem. Corp.

EXTRUSIONS, NON-METALLIC

Auburn Mfg. Co., The
Borden Chemical Co., The, Div.—The Borden Co., Resinite Dept.
Columbia Rope Co.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
Crystal-X Corp.
Delta Chemical Works, Inc.
Dixon Corp.
Electric Auto-Lite Co., The
B. F. Goodrich Aviaiton Products
Jodee Plastics Co.
Chester Morton Electronics Corp.
New England Tape Co. Inc.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Revere Copper & Brass Inc.
Rex Corp., The
Rubatex Div., Great American Industries, Inc.
Saxonburg Ceramics
Saylor Electric Products Corp.
Thermo Materials, Inc.
Tri-Point Plastics Inc.
Varflex Corp.

EYELETS

American Brass Co., The
Circon Component Corp.
Corbin Products Div.
Electronic Techniques, Inc.
Eyelet Tool Co. Inc.
Federal Screw Products Inc.
Gasket, Packing & Specialty Co. Inc.
General Components Inc.
Goe Engrg. Co.
Walter K. Jaros, Aircrafters
Litton Industries, Components Div.
R. I. Metpro, Inc.
Rodney Metals Inc.
Sylvania Electric Products Inc., Parts Div.
United Shoe Machinery Corp.
United-Carr Fastener Corp.
Vector Electronic Co.
Waterbury Companies, Inc.
Waterbury Pressed Metal Co., The

FABRIC

Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
C. R. Daniels, Inc.
Hi-Shear Rivet Tool Co.
Schlegel Mfg. Co.
E. F. Timme & Son, Inc.
Wagner Awning & Mfg. Co., The

FASTENERS

Abbott Screw & Mfg. Co.
Adams Rite Mfg. Co.
Alden Systems Co.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
American Brass Co., The
American Standard Products, Inc.
Aviation Developments Inc.
Bland Burner Co., The
Boots Aircraft Nut Corp.
Briles Mfg.
Camloc Fastener Corp.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Chicago Screw Co., The, Div.—Standard Screw Co.
Columbus Bolt & Forging Co.
Continental Screw Co.
Dimco-Gray Co.
Elastic Stop Nut Corp. of America
Federal Screw Products Inc.
B. F. Goodrich Aviation Products
***HARTFORD MACHINE SCREW CO., DIV.—STANDARD SCREW CO.**
Hi-Shear Rivet Tool Co.
Horst Engrg. & Mfg. Co.
Huck Mfg. Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Lion Fastener Co., Inc.
Mercury Air Parts Co., Inc.
Nutt-Shel Co.
Pioneer Aluminum Inc.
Reed & Prince Mfg. Co.
Rosan, Inc.
Shur-Lok Corp.
Simmons Fastener Corp.
Standard Pressed Steel Co.
Thompson-Bremer & Co.
Tinnerman Products, Inc.
Titanium Metals Corp. of America
Torrington Co., The
United Shoe Machinery Corp.
United Supply Co.
United-Carr Fastener Corp.
Waldom Electronics Inc.
Westfield Metal Products Co., Inc.
Wrought Washer Mfg. Co.

Blind

Aluminum Co. of America
Aviation Developments Inc.
Boots Aircraft Nut Corp.
Brush Nail Expansion Bolt Co.
Century Fasteners Corp.
Dill Mfg. Co., The
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
B. F. Goodrich Aviation Products
Huck Mfg. Co.
Walter K. Jaros, Aircrafters
Shur-Lok Corp.
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Jodee Plastics Co.
Walter Lee Chemical Corp.
R. I. Metpro, Inc.
Pacific Cut Washer Co.
Penn Fibre & Specialty Co., Inc.
Roberts Toledo Rubber Co., The
Rubbercraft Corp. of California
Servicair Co.
Shur-Lok Corp.
Skytronics
United Shoe Machinery Corp.
United-Carr Fastener Corp.
Wagner Awning & Mfg. Co., The
Waldom Electronics, Inc.
Waterbury Companies, Inc.
Western Felt Works

GROMMETS, FIBRE

Allied Plastics Supply Corp.
Amatom Electronic Hardware Co., Inc.
Auburn Mfg. Co., The
N. S. Baer Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dumont Aviation Associates
Emerson Plastics Corp.
Federal Screw Products, Inc.
Walter K. Jaros, Aircrafters
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Spaulding Fibre Co., Inc.

HOISTS, AIRBORNE

All American Aircraft Products, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Associated Co., Inc.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.
Cromer Mfg. & Engrg., Inc.
*DALMO VICTOR CO., DIV.-TEXTRON, INC.
Detroit Hoist & Machine Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
*ELECTROL INC.
Foote Brothers Gear & Machine Corp.
G. W. Galloway Co.
Hexcel Products Inc.
Walter K. Jaros, Aircrafters
Kelsey-Hayes Co.
O & M Machine Co., Inc.
Ozone Metal Products Corp.
*REGENT JACK MFG. CO., INC.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co., Inc.

HYDRAULIC RESERVOIRS

ACF Industries, Inc., Advanced Products Div.
Accessory Controls & Equipment Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Arkwin Industries, Inc.
Auto-Control Labs., Inc.
Bendix Products Div., Bendix Aviation Corp.
Bridgwater Machine Co.
Cadillac Gage Co.
Champion Airquipment, Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
*COOPER DEVELOPMENT CORP.
*DALMO VICTOR CO., DIV.-TEXTRON, INC.
*DIVERSEY ENGRG. CO.
Eaton Mfg. Co., Inc., Fredric Flader Div.
*GREER HYDRAULICS, INC.
Hein-Werner Corp.
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Hydra-Power Corp.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
La Pointe Industries, Inc.
Menasco Mfg. Co.
Oil-Dyne, Inc.
Pacific Div.-Bendix Aviation Corp.
Petch Mfg. Co.
Pressed Steel Tank Co.
Progressive Research & Development Co., Inc.
Ryan Aeronautical Co.
Sargent Engrg. Corp.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co., Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Weatherhead Co., The
Wells Industries Corp.
Westholt Mfg. Co.
Wickfield, Inc.

HYDRAULIC SYSTEMS AND CONTROLS

Accessory Controls & Equipment Corp.
Acme Industrial Co.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aerotec Corp., The
Aero-Test Equipment Co., Inc.
Alco Valve Co.
Altair, Inc.
Applied Dynamics Corp.
Arkwin Industries, Inc.
Auto-Control Labs., Inc.
Automatic Switch Co.
Bendix Products Div., Bendix Aviation Corp.
Bridgwater Machine Co.
CDC Control Services, Inc.
Cadillac Gage Co.
Champion Airquipment, Inc.
Clary Dynamics
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
*COMMERCIAL STAMPING & SHEARING CO.
Consolidated Controls Corp.
*CORNELIUS CO., THE
*DALMO VICTOR CO., DIV.-TEXTRON, INC.
Joe Davidson & Associates
Devco Engrg., Inc.
*DIVERSEY ENGRG. CO.
Dynamic Controls Corp.
*EASTERN INDUSTRIES, INC.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Eddington Metal Specialty Co.
Electric Auto-Lite Co., The
*ELECTROL, INC.
Engelberg Huller Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Futurecraft Corp.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geisler Labs.
General Cement Mfg. Co., Div.-Textron, Inc.
General Controls Co.
Gray & Huleguard, Inc.
*GREER HYDRAULICS, INC.
Hagan Chemicals & Controls, Inc.
Hoof Products Co.
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Hupp Aviation Co.
Walter J. Hyatt Co., The
Hydra-Power Corp.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kearfott Co., Inc.
Kelsey-Hayes Co.
Kemp Aero Products, Div.-Kemp, Inc.
Kerns Mfg. Corp.
Koehler Aircraft Products Co., Inc.
La Pointe Industries, Inc.
*WALLACE O. LEONARD, INC.
Loewy-Hydropress, Div.-Baldwin-Lima-Hamilton
Lyndon Aircraft, Inc.
Menasco Mfg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
New York Air Brake Co., The, Watertown Div.
Oil-Dyne, Inc.
Pacific Div.-Bendix Aviation Corp.
Parameters, Inc.
Pesco Products Div.-Borg-Warner Corp.
Petch Mfg. Co.
H. K. Porter, Inc.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Rivett Lathe & Grinder, Inc.
Royal Industries, Inc.
Ryan Aeronautical Co.
A. U. Stone & Co., Inc.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Tactair Valve Div.-Aircraft Products Co.
Talley Corp., The
Thompson Products, Inc.
Trimount Instrument Co.
*UNITED AIRCRAFT PRODUCTS, INC.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co., Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Wave Particle Corp.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Wickfield, Inc.

INSULATING COMPOUNDS

Biwax Corp.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
Emerson & Cuming, Inc.
General Cement Mfg. Co., Div.-Textron, Inc.
Hastings Plastics, Inc.
Hi-Test Chemical Corp.
***IDEAL CHEMICAL PRODUCTS, INC.**
Joclin Mfg. Co.
Johns-Mansville Dutch Brand Div.
Magnetic Shield Div.-Perfection Mica Co.
New England Tape Co., Inc.
Silicones Div.-Union Carbide Corp.
A. U. Stone & Co., Inc.
Topper Mfg. Co., Inc.
Zophar Mills, Inc.

INSULATION MATERIALS

Aero Leather Products Co.
Air Products, Inc.
Anachrome Corp.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Calfibe Co., Inc.
***COOPER DEVELOPMENT CORP.**
Crystal-X Corp.
Delta Chemical Works, Inc.
Dixon Corp.
Duracote Corp.
Eagle-Picher Co., The
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Furane Plastics, Inc.
General Electric Co., Apparatus Sales Div.
Hastings Plastics, Inc.
Industrial Mica Corp.
Isolantite Mfg. Corp.
Jodee Plastics Co.
Joseph Kaye & Co.
Walter Lee Chemical Corp.
Midland Paint & Varnish Co., The
New England Tape Co., Inc.
Nopco Chemical Co.
Norton Co.
Raybestos-Manhattan, Inc.
Rubatex Div., Great American Industries, Inc.
Saxonburg Ceramics
Schlegel Mfg. Co.
Seaman Products
Silicones Div.-Union Carbide Corp.
Synthane Corp.
H. I. Thompson Fiber Glass Co.
Topper Mfg. Co., Inc.
Union Asbestos & Rubber Co.
Warren Wire Co.
Western Felt Works
Zippertubing Co., The

Aluminum Oxide

Aluminum Co. of America
Anachrome Corp.
B G Corp., The
Corning Glass Works
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Electronic Mechanics, Inc.
Linde Co., Div.-Union Carbide
Morganite, Inc.
Chester Morton Electronics Corp.
Mykroy, Inc.
Norton Co.
Saxonburg Ceramics
D. M. Steward Mfg. Co.
Western Gold & Platinum

Asbestos

Allied Plastics Supply Corp.
Atlas Asbestos Co.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Delta Chemical Works, Inc.
General Electric Co., Apparatus Sales Div.
Olympic Plastics Co., Inc.
Raybestos-Manhattan, Inc.
Union Asbestos & Rubber Co.
Zippertubing Co., The

Ceramic

Allied Plastics Supply Corp.
Atlas Asbestos Co.
Auburn Spark Plug Co., Inc.
B G Corp., The
Bendix Products Div., Bendix Aviation Corp.
Corning Glass Works
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Erie Resistor Corp.
Isolantite Mfg. Corp.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Rogers Corp.
Saxonburg Ceramics
D. M. Steward Mfg. Co.
Thermo Materials, Inc.
Topper Mfg. Co., Inc.
Zirconium Corp. of America

Fabric

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Duracote Corp.
Franklin Fibre-Lamitex Corp.
General Electric Co., Apparatus Sales Div.
General Plastics Corp. of New Jersey
Hastings Plastics, Inc.
Mica Fabricating Co.
Mykroy, Inc.
National Research Corp.
Olympic Plastics Co., Inc.
Schlegel Mfg. Co.
Seaman Products
Synthane Corp.
H. I. Thompson Fiber Glass Co.
E. F. Timme & Son, Inc.
Union Asbestos & Rubber Co.
Warren Wire Co.
Zippertubing Co., The

Fibre

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Connector Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dayton Aircraft Products, Inc.
Flock Process Co., Inc.
Franklin Fibre-Lamitex Corp.
General Electric Co., Apparatus Sales Div.
General Gasket, Inc.
Hastings Plastics, Inc.
L. O. F. Glass Fibers Co.
Mica Fabricating Co.
Olympic Plastics Co., Inc.
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Seaman Products
Spaulding Fibre Co., Inc.
William W. Stanley Co., Inc.
H. I. Thompson Fiber Glass Co.
Union Asbestos & Rubber Co.
Warren Wire Co.

Glass

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Semon Bache & Co.
Cordo Molding Products, Inc.
Corning Glass Works
Duracote Corp.
General Electric Co., Apparatus Sales Div.
Hastings Plastics, Inc.
L. O. F. Glass Fibers Co.
Mica Fabricating Co.
Mykroy, Inc.
Philadelphia Scientific Glass Co.
Seaman Products
Synthane Corp.
H. I. Thompson Fiber Glass Co.
Warren Wire Co.
Zippertubing Co., The

Glass Fibre

Aero Leather Products Co.
Allied Plastics Supply Corp.
Atlas Asbestos Co.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Duracote Corp.
Eagle-Picher Co., The
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Furane Plastics, Inc.
General Electric Co., Apparatus Sales Div.
Hastings Plastics, Inc.
Hays Mfg. Co.
L. O. F. Glass Fibers Co.
Lamtex Industries, Inc.
Mica Fabricating Co.
New Englnad Laminates Co., Inc.
Olympic Plastics Co., Inc.
Penn Fibre & Specialty Co., Inc.
Seaman Products
Silicone Insulation, Inc.
William W. Stanley Co., Inc.
Synthane Corp.
H. I. Thompson Fiber Glass Co.
Varflex Corp.
Warren Wire Co.
Zippertubing Co., The

Nylon

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Dayton Aircraft Products, Inc.
Duracote Corp.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
General Electric Co., Apparatus Sales Div.
General Gasket, Inc.
General Plastics Corp. of New Jersey
Illumitronic Engrg. Co.
Jodee Plastics Co.
Mica Fabricating Co.
Olympic Plastics Co., Inc.
Penn Fibre & Specialty Co., Inc.
Science House, Inc.
William W. Stanley Co., Inc.
Synthane Corp.
Varflex Corp.
Waterbury Companies, Inc.
Zippertubing Co., The

Paper

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Franklin Fibre-Lamitex Corp.
General Gasket, Inc.
Industrial Mica Corp.
Magnetic Shield Div.-Perfection Mica Co.
National Research Corp.
New England Laminates Co., Inc.
Rogers Corp.
William W. Stanley Co., Inc.
Synthane Corp.

INSULATION PARTS

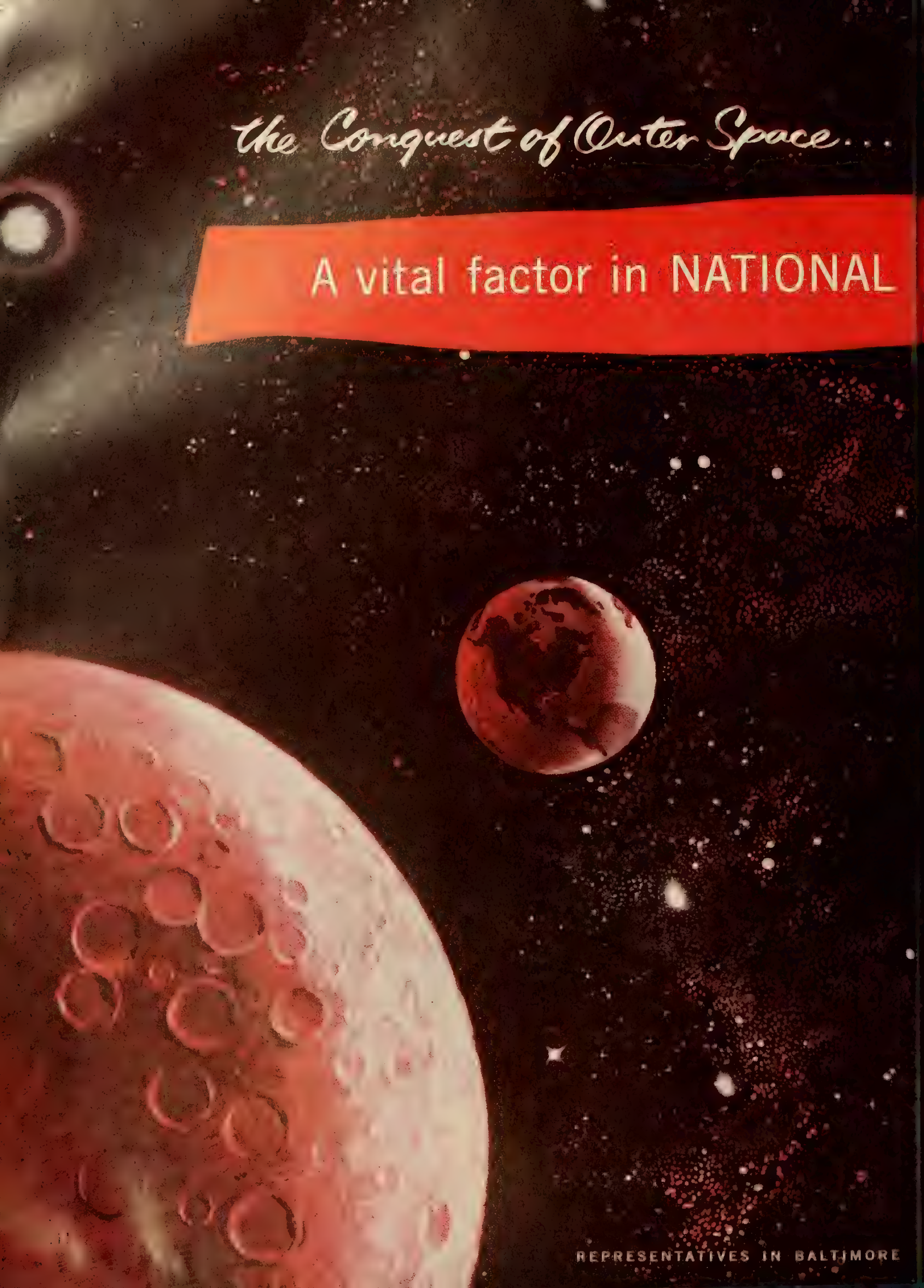
Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Dixon Corp.
Du-Co Ceramics Co.
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Enflo Corp.
Franklin Fibre-Lamitex Corp.
Gunnar Laboratories
Jodee Plastics Co.
Keystone Electronics Corp.
Walter Lee Chemical Corp.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Olympic Plastics Co., Inc.
Seaman Products
Surprenant Mfg. Co.
Swedlow Plastics Co.
TA Mfg. Corp.

Ceramic Insulation Parts

Allied Plastics Supply Corp.
Auburn Spark Plug Co., Inc.
B G Corp., The
Bendix Products Div., Bendix Aviation Corp.
***COOPER DEVELOPMENT CORP.**
Corning Glass Works
Dayton Aircraft Products, Inc.
Diamonite Products Mfg. Co.
Wilbur B. Driver Co.
Du-Co Ceramics Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Erie Resistor Corp.
General Cement Mfg. Co., Div.-Textron, Inc.
General Ceramics Corp.
Heldor Mfg. Co., Inc.
Isolantite Mfg. Corp.
Joclin Mfg. Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
Mykroy, Inc.
Saxonburg Ceramics
Skytronics
D. M. Steward Mfg. Co.
Teletronic Labs., Inc.
Thermo Materials, Inc.
Western Gold & Platinum
***WESTINGHOUSE ELECTRIC CORP.**
Zirconium Corp. of America

Insulating Sleeves

Allied Plastics Supply Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
B. & C. Insulation Products, Inc.
B G Corp., The
Birnbach Radio Co., Inc.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Crystal-X Corp.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Diamonite Products Mfg. Co.
Dixon Corp.
Electronic Mechanics, Inc.
Emerson Plastics Corp.
Enflo Corp.
Franklin Fibre-Lamitex Corp.
Furane Plastics, Inc.
Gatke Corp.
Hastings Plastics, Inc.
Joclin Mfg. Co.
Jodee Plastics Co.
Lamtex Industries, Inc.
Walter Lee Chemical Corp.
Magnetic Shield Div.-Perfection Mica Co.
Maryland Lava Co.
Mica Fabricating Co.
Mykroy, Inc.
New England Tape Co., Inc.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Resdel Corp.
Resistoflex Corp.
Saxonburg Ceramics
Skytronics
Sparta Mfg. Co.
D. M. Steward Mfg. Co.
Surprenant Mfg. Co.
Synthane Corp.
TA Mfg. Corp.
Tri-Point Plastics, Inc.
Varflex Corp.
Wagner Awning & Mfg. Co., The

Sheets

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Crane Packing Co.
Crystal-X Corp.
Diamonite Products Mfg. Co.
Dixon Corp.
Du-Co Ceramics Co.
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Enflo Corp.
Flock Process Co., Inc.
Franklin Fibre-Lamitex Corp.
Furane Plastics, Inc.
Gatke Corp.
General Gasket, Inc.
Gunnar Laboratories
Hastings Plastics, Inc.
Hays Mfg. Co.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Mica Fabricating Co.
Mycalex Corp. of America
Mykroy, Inc.
New England Laminates Co., Inc.
Penn Fibre & Specialty Co., Inc.
Resistoflex Corp.
Rex Corp., The
Rubbercraft Corp. of California
Seaman Products
Sparta Mfg. Co.
Synthane Corp.
Warren Wire Co.

Rods

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Crane Packing Co.
Crystal-X Corp.
Diamonite Products Mfg. Co.
Dixon Corp.
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Enflo Corp.
Franklin Fibre-Lamitex Corp.
Gatke Corp.
Gunnar Laboratories
Jodee Plastics Co.
Walter Lee Chemical Corp.
Marblette Corp., The
Mica Fabricating Co.
Mycalex Corp. of America
Mykroy, Inc.
New England Tape Co. Inc.
Penn Fibre & Specialty Co., Inc.
Resistoflex Corp.
Rex Corp., The
Rubbercraft Corp. of California
Sparta Mfg. Co.
D. M. Steward Mfg. Co.
Synthane Corp.
Tri-Point Plastics Inc.

Silicone Rubber

Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Bacon Industries, Inc.
Chicago-Allis Mfg. Corp.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Continental Rubber Works
Delta Chemical Works, Inc.
Du-Co Ceramics Co.
Eagle-Picher Co., The
Eco Engrg. Co.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Garrett Corp., The, Air Cruisers Div.
General Electric Co., Apparatus Sales Div.
General Gasket Inc.
B. F. Goodrich Aviation Products
Hallett Mfg. Co.
Litton Industries, Components Div.
Neosil Products Co.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Rogers Corp.
Rubbercraft Corp. of California
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Skytronics
TA Mfg. Corp.
Varflex Corp.

INSULATORS

Accurate Electronics Corp., Dept. D
Allied Plastics Supply Corp.
Auburn Spark Plug Co., Inc.
Birnbach Radio Co., Inc.
Biwax Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Dayton Aircraft Products, Inc.
Diamonite Products Mfg. Co.
Dixon Corp.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Enflo Corp.
Erie Resistor Corp.
Franklin Fibre-Lamitex Corp.
Garde Mfg. Co.
Gatke Corp.
General Ceramics Corp.
Hallett Mfg. Co.
Isolantite Mfg. Corp.
Joclin Mfg. Co.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
Maryland Lava Co.
Mica Fabricating Co.
Mycalex Corp. of America
Mykroy, Inc.
Olympic Plastics Co., Inc.
Peerless Products Industries
Rubbercraft Corp. of California
Saxonburg Ceramics
Silicone Insulation, Inc.
D. M. Steward Mfg. Co.
Synthane Corp.
Tri-Dex Co.
Tri-Point Plastics Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wind Turbine Co.

IRON

American Silver Co.
Crucible Steel Co. of America
G. M. Dykes Iron Works, Inc.
Penn Fibre & Specialty Co., Inc.
Republic Steel Corp.
Rodney Metals Inc.
St. Regis Paper Co.

LAMINATES

Allied Plastics Supply Corp.
American Aerophysics Corp.
Basic Tool Industries, Inc.
Carl Biggs Co.
Bomyte Co., The
Bridgeport Brass Co.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dwyer Engrg. Co., Inc.
Electronic Mechanics, Inc.
Elektro-Serv Co.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Garrett Corp., The, Air Cruisers Div.
Gasket, Packing & Specialty Co. Inc.
Gatke Corp.
General Plastics Corp. of New Jersey
Goodyear Aircraft Corp.
Hastings Plastics Inc.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Joclin Mfg. Co.
Lamtex Industries, Inc.
Leach & Garner Co., Industrial Div.
Luminous Resins Inc.
Met-L-Wood Corp.
Mica Corp.
New England Laminates Co., Inc.
Raybestos-Manhattan, Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
Rogers Corp.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Standard Metals Corp.
Swedlow Plastics Co.
Synthane Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Virginia Plak Co.
Warren Wire Co.

LANDING GEAR ASSEMBLIES

***AMERICAN MACHINE & FOUNDRY CO.**
American Steel Foundries, Hammond Div.
Associated Co., Inc.
Bendix Products Div., Bendix Aviation Corp.
Bridgwater Machine Co.
Clary Dynamics
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Cromer Mfg. & Engrg., Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
G. W. Galloway Co.
***GREER HYDRAULICS, INC.**
Hydra-Power Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
La Pointe Industries Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Machine Engrg. Co. Inc.
Modglin Co. Inc.
Parish Pressed Steel, Div.-Dana Corp.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Royal Industries, Inc.
Shaw Metal Products Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America

LATCHES

Adams Rite Mfg. Co.
Camloc Fastener Corp.
Conax Corp.
Dayton Mfg. Co., Inc.
Engineered Products Co., The
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Misco Precision Casting Co.
Modglin Co. Inc.
National Lock Co.
Robot Appliances Inc.
Shaw Metal Products Corp.
Simmonds Aerocessories, Inc.
United States Chemical Milling Corp.
United Supply Co.

LATHES, BENCH

Clausing Div.-Atlas Press Co.
F. W. Derbyshire, Inc.
Jones & Lamson Machine Co.
R. K. Leblond Machine Tool Co.
Rivett Lathe & Grinder Inc.

LEAD & ALLOYS

Accurate Specialties Co. Inc.
Alpha Metals, Inc.
American Brake Shoe Co.
Anchor Metal Co. Inc.
Bar-Ray Products, Inc.
Belmont Smelting & Refining Works, Inc.
Bow Solder Products Co., Inc.
Division Lead Co.
Duroyd Gasket Mfg. Co.
Gasket, Packing & Specialty Co. Inc.
Goldsmith Brothers Smelting & Refining Co.
Harmon, Lichtenstein & Co.
Johnson Mfg. Co., Inc.

LINERS, CAN

Kelsey-Hayes Co.
Modglin Co. Inc.
Ryan Aeronautical Co.
Warren Mfg. Div., Warren Brothers Roads Co.

LITHIUM

American Potash & Chemical Corp., National Northern Div.
Bram Metallurgical & Chemical Co.
Foote Mineral Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.

LOCKNUTS

Allmetal Screw Products Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
R. C. Dudek & Co.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
Federal Screw Products Inc.
Hart Metal Products Corp.
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kemp Inc.
Kerns Mfg. Corp.

National Lock Co.
Nutt-Shel Co.
Rattan Mfg. Co., The
Shur-Lok Corp.
Standard Locknut & Lockwasher Inc.
Standard Pressed Steel Co.
United-Carr Fastener Corp.
Waterbury Pressed Metal Co., The

MAGNESIUM & ALLOYS

Aluminum Corp. of America
American Silver Co.
Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Dow Chemical Co., The
Hahn & Clay
Hart Metal Products Corp.
Light Metals, Inc.
Magline Inc.
Modglin Co. Inc.

MANGANESE

Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Foote Mineral Co.
Metals & Controls Corp.
Modglin Co. Inc.

MANIFOLDS, AIR SYSTEM

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Car & Foundry Div., ACF Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
*AMERICAN TUBE BENDING CO., INC.
Associated Co., Inc.
Auto-Control Labs., Inc.
Beaton & Corbin Mfg. Co., The
Bridgwater Machine Co.
Cromer Mfg. & Engrg., Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Hastings Plastics Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Koehler Aircraft Products Co., Inc.
*LAVELLE AIRCRAFT CORP.
Misco Precision Casting Co.
Modglin Co. Inc.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
Twin Coach Co.-Aircraft Div.
Weber Aircraft Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

MERCURY

Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Dynametrics Corp.
Eastern Smelting & Refining Corp.
Goldsmith Brothers Smelting & Refining Co.
Hammett Electric Co.
Magnetic Shield Div.-Perfection Mica Co.
Philadelphia Scientific Glass Co.
St. Regis Paper Co.
Thompson Products, Inc.

METAL CLAD SHEETS

Allied Plastics Supply Corp.
Alpha Metals, Inc.
Aluminum Corp. of America
American Silver Co.
Bram Metallurgical & Chemical Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dwyer Engrg. Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Leach & Garner Co., Industrial Div.
Luria Engrg. Co.
Metals & Controls Corp.
Mica Corp.
Modglin Co. Inc.
New England Laminates Co., Inc.
Revere Copper & Brass Inc.
Standard Metals Corp.
Synthane Corp.
Techniques, Inc.

METAL MACHINING

Abalon Precision Mfg. Corp.
Aerodex, Inc.
Aircraft Fitting Co., The
Aircraft Mechanics, Inc.
Altamil Corp.
American Brass Co., The
American Car & Foundry Div., ACF Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Welding & Mfg. Co., The
Ampco Metal, Inc.
Arnolt Corp.
Associated Co., Inc.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Basic Tool Industries, Inc.
Bridgwater Machine Co.
J. H. Bunnell & Co.
California Aircraft Products
Century Fasteners Corp.
Champion Airquipment Inc.
C. B. Christiansen Co.
Clausing Div.-Atlas Press Co.
*COOPER DEVELOPMENT CORP.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
J. P. DeVine Mfg. Co.
G. M. Diehl Machine Works
*DIVERSEY ENGRG. CO.
Dwyer Engrg. Co., Inc.
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Eco Engrg. Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Essex Mfg. Co., Inc.
Ex-Cell-O Corp.
Federal Machine Co. Inc.
Freeman Co., The
General Components Inc.
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
B. H. Hadley, Inc.
Hahn & Clay
Heldor Mfg. Co., Inc.
Alfred Hofmann & Co.
Hupp Aviation Co.
Hydra-Power Corp.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Walter K. Jaros, Aircrafters
Jennings & Co.
Jones & Lamson Machine Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kellett Aircraft Corp.
Kelsey-Hayes Co.
Kemp Inc.
Kerns Mfg. Corp.
Ladish Co.
Leach & Garner Co., Industrial Div.
Luria Engrg. Co.
*LYCOMING DIV., AVCO MFG. CORP.
Lytle Engrg. & Mfg. Co.
Machine Engrg. Co. Inc.
J. A. Maurer, Inc.
Mechanical Div.-General Mills, Inc.
Menasco Mfg. Co.
Mercury Air Parts Co., Inc.
Mercury International Industries Inc.
Merz Engrg., Inc.
Metal Masters, Inc.
Henry & Miller Industries, Inc.
Milman Engrg. Co.
Modglin Co. Inc.
National Airoil Burner Co.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Onsrud Machine Works, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Philco Corp., Government & Industrial Divs.
Phillips Aviation Co.
Process & Instruments
Quick Charge Corp.
Reid Metal Products, Inc.
*RHEEM MFG. CO., AIRCRAFT DIV.
Rowe Industries
Ryan Aeronautical Co.
*SCREW PRODUCTS CORP. OF AMERICA
Seamless Products Co., Inc.
Sesco Mfg., Inc.
Shaw Metal Products Corp.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Sinclair Mfg. Co.
Specialties Mfg. Co., Inc.
Stanat Mfg. Co., Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Stanley Aviation Corp.
Talley Corp., The
Tapered Air Products Corp.
Thompson Products, Inc.
Arthur Tickle Engrg. Works, Inc.
Turbo Products, Inc.
Twin Coach Co.-Aircraft Div.
Twix Mfg. Co., Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
United Mfg. Co., The
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United States Chemical Milling Corp.
Universal Metal Products Inc.
Uniwave, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Weber Aircraft Corp.
Wells Industries Corp.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Wickfield, Inc.
Wind Turbine Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

METAL PARTS

Abalon Precision Mfg. Corp.
Abbott Screw & Mfg. Co.
Accurate Electronics Corp., Dept D
Aerodex, Inc.
Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Associated Co., Inc.
Auburn Mfg. Co., The
Bound Brook Oil-less Bearing Co.
Bridgwater Machine Co.
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Kelsey-Hayes Co.
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Keystone Electronics Corp.
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*LYCOMING DIV., AVCO MFG. CORP.
Lytle Engrg. & Mfg. Co.
P. R. Mallory & Co., Inc.
J. A. Maurer, Inc.
Mercury Air Parts Co., Inc.
Metal Masters, Inc.
R. I. Metpro, Inc.
Henry & Miller Industries, Inc.
Modglin Co. Inc.
Pacific Cut Washer Co.
Peerless Products Industries
Progressive Research & Development Co., Inc.
Quick Charge Corp.
Raybestos-Manhattan, Inc.
Reid Metal Products, Inc.
Rosan, Inc.
Ryan Aeronautical Co.
St. Marys Carbon Co.
*SCREW PRODUCTS CORP. OF AMERICA
Sinclair Mfg. Co.
Smith-Morris Corp.
Standard Metals Corp.
Wm. Steinen Mfg. Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
*STAINLESS PROCESSING DIV., WALL COLMONOY CORP.
Standard Pressed Steel Co.
Stanley Aviation Corp.
Sylvania Electric Products Inc., Parts Div.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Titan Metal Mfg. Co.
Torrington Co., The
Twin Coach Co.-Aircraft Div.
*UNITED AIRCRAFT PRODUCTS, INC.
United Mfg. Co., The
United Shoe Machinery Corp.
Universal Metal Products Inc.
Uniwave, Inc.
Westholt Mfg. Co.
Wickfield, Inc.

Bushings

Abbott Screw & Mfg. Co.
Acme Industrial Co.
Aircraft Fitting Co., The
Amatom Electronic Hardware Co. Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Non Gran Bronze Co.
American Standard Products, Inc.
American Steel Foundries, Hammond Div.
Ampco Metal, Inc.
Associated Co., Inc.
Bearium Metals Corp.
Bergen Carbide Co.
Bound Brook Oil-less Bearing Co.
Century Fasteners Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Collins Engrg. Corp.
Dayton Mfg. Co., Inc.
R. C. Dudek & Co.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Eco Engrg. Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Ex-Cell-O Corp.
General Railway Signal Co.
Graphite Metallizing Corp.
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kemp Inc.
Keystone Electronics Corp.
Litton Industries, Components Div.
*LYCOMING DIV., AVCO MFG. CORP.
Magnetic Shield Div.-Perfection Mica Co.
Orange Roller Bearing Co., Inc.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Peerless Products Industries
True Alloys Inc.
Rattan Mfg. Co., The
Rosan, Inc.
St. Marys Carbon Co.
*SCREW PRODUCTS CORP. OF AMERICA
Seamless Products Co., Inc.
Shenango Furnace Co., The, Centrifugally Cast Products Div.
Sinclair Mfg. Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Carbon Products, Inc.
Waltham Screw Co.
Wrought Washer Mfg. Co.

Powdered

Aluminum Co. of America
Amplex Div.-Chrysler Corp.
[illegible] Aviation Corp., York Div.
Bound Brook Oil-less Bearing Co.
Eaton Mfg. Co.
Gibson Electric Co.
P. R. Mallory & Co., Inc.
Mercury Air Parts Co., Inc.
Orange Roller Bearing Co., Inc.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Raybestos-Manhattan, Inc.
St. Marys Carbon So.
***STAINLESS PROCESSING DIV., WALL COLMONOY CORP.**
Stewart-Warner Corp.
Superior Carbon Products, Inc.
Thompson Products, Inc.
S. K. Wellman Co., The
***WESTINGHOUSE ELECTRIC CORP.**

Screw Machine

Abalon Precision Mfg. Corp.
Abbott Screw & Mfg. Co.
Acme Industrial Co.
Aero Supply Mfg. Co., Inc.
Affiliated Screw Products Co.
Aircraft Fitting Co., The
Aluminum Co. of America
Amatom Electronic Hardware Co. Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Non Gran Bronze Co.
American Standard Products, Inc.
Arnolt Corp.
Associated Co., Inc.
Auburn Spark Plug Co., Inc.
***AVCO MFG. CO., CROSLEY DIV.**
Brighton Tool & Die Co.
Briles Mfg.
J. H. Bunnell & Co.
Century Fasteners Corp.
Chicago Screw Co., The, Div.-Standard Screw Co.
Circon Component Corp.
Clark Equipment Co.
Coaxial Connector Co. Inc.
Connector Corp. of America
Corbin Products Div.
Dalmore Corp.
Dayton Mfg. Co., Inc.
Dill Mfg. Co., The
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Eco Engrg. Co.
Electronic Techniques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Engineered Products Co., The
Ex-Cell-O Corp.
Federal Screw Products Inc.
Freeman Co., The
Geartronics Corp.
General Components Inc.
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
Goe Engrg. Co.
Graflex, Inc.
Hamilton Watch Co., Military Products Div.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Heldor Mfg. Co., Inc.
Alfred Hofmann & Co.
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Jones & Lamson Machine Co.
Kasar Mfg. & Distributing Co., Inc.
Leach & Garner Co., Industrial Div.
Litton Industries, Components Div.
J. A. Maurer, Inc.
Mercury Air Parts Co., Inc.
National Airoil Burner Co.
National Lock Co.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Peerless Products Industries
Philco Corp., Government & Industrial Divs.
H. K. Porter Inc.
Precise Instrument Parts Co., A Corp.
Research Development Mfg. Inc.
Richards Electrocraft, Inc.
Rosan, Inc.
***SCREW PRODUCTS CORP. OF AMERICA**
Seamless Products Co., Inc.
Sinclair Mfg. Co.
Skinner Precision Products
Herman D. Steel Co.
Wm. Steinen Mfg. Co.
Stevens Walden Inc.
Suffolk Products Corp.
Standard Locknut & Lockwasher Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Standard Pressed Steel Co.
Technical Oil Tool Corp.
Titan Metal Mfg. Co.
Torrington Co., The
***UNITED AIRCRAFT PRODUCTS, INC.**
United Mfg. Co., The
Waltham Screw Co.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.
Wilmar Mfg. Co., Inc.
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss-Wright Corp.

Small Metal Stampings

A&P Metal Products Mfg. Corp.
Abalon Precision Mfg. Corp.
Abbott Screw & Mfg. Co.
Accurate Electronics Corp., Dept. D
Accurate Specialties Co., Inc.
Acme Mfg. & Gasket Co.
Aerodex, Inc.
Aerolite Electronics Corp.
Aircraft Mechanics, Inc.
Alpha Metals, Inc.
Aluminum Co. of America
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Anchor Metal Co. Inc.
Associated Co., Inc.
Atlas E-E Corp.
Auburn Mfg. Co., The
Augat Brothers, Inc.
***AVCO MFG. CO., CROSLEY DIV.**
Basic Tool Industries, Inc.
Bergen Carbide Co.
Blaco Mfg. Co.
H. Braun Tool & Instrument Co., Inc.
J. H. Bunnell & Co.
California Aircraft Products
Carroll Pressed Metal, Inc.
Conco Engrg. Works
Corbin Products Div.
Dayton Mfg. Co., Inc.
J. P. DeVine Mfg. Co.
Dill Mfg. Co., The
Dittmore-Freimuth Corp.
Dumont Aviation Associates
G. M. Dykes Iron Works, Inc.
Electronic Techniques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Elm Mfg. Co. Inc.
Engineered Products Co., The
Erie Resistor Corp.
Garde Mfg. Co.
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Gasket, Packing & Specialty Co. Inc.
General Components Inc.
General Findings & Supply Co., Industrial Div.

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COMPANY__________
STREET__________

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Mild Steel with laminations of .002" or .003"

Stainless Steel with laminations of .002" or .003"

Aluminum with laminations of .003" only

General Railway Signal Co.
Gunnar Laboratories
Hamilton Watch Co., Military Products Div.
Hobson Brothers, Inc.
Ludwig Honold Mfg. Co.
Horst Engrg. & Mfg. Co.
Hunter Spring Co.
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kling Metal Spinning & Stamping Co.
***LAMINATED SHIM CO.**
Leach & Garner Co., Industrial Div.
Leetronics, Inc.
Longren Aircraft Co., Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Lytle Engrg. & Mfg. Co.
Machine Engrg. Co. Inc.
Metal Forming Corp.
Metal Masters, Inc.
R. I. Metpro, Inc.
Henry & Miller Industries, Inc.
National Lock Co.
Pacific Cut Washer Co.
Parish Pressed Steel Div.-Dana Corp.
Paul & Beekman, Inc.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Philco Corp., Government & Industrial Divs.
Positive Lock Washer Co., The
Progressive Research & Development Co., Inc.
Quick Charge Corp.
Reliable Spring & Wire Forms Co., The
Revere Copper & Brass Inc.
Richards Electrocraft, Inc.
Roland Teiner Co. Inc.
Rowe Industries
Ryan Aeronautical Co.
St. Marys Carbon Co.
Schaffer Air Industries, Inc.
Seamless Products Co., Inc.
Shaw Metal Products Corp.
Sinclair Mfg. Co.
South River Metal Products Co., Inc.
Specialties Mfg. Co., Inc.
***STAINLESS PROCESSING DIV., WALL COLMONOY CORP.**
Standard Metals Corp.
Wm. Steinen Mfg. Co.
Stevens Walden Inc.
Superior Spinning & Stamping Co.
Sylvania Electric Products Inc., Parts Div.
Technical Oil Tool Corp.
Techniques, Inc.
Transue & Williams Steel Forging Corp.
Tricon Mfg. Co.
Turbo Products, Inc.
Twin Coach Co.-Aircraft Div.
Twix Mfg. Co., Inc.
Ucinite Co., The, Div.-United-Carr Fastener Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Shoe Machinery Corp.
United-Carr Fastener Corp.
Universal Metal Products Inc.
Waterbury Companies, Inc.
Waterbury Pressed Metal Co., The
Wayne Foundry & Stamping Co.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Winder Aircraft Corp. of Fla.
Wrought Washer Mfg. Co.

Spinnings

A&P Metal Products Mfg. Corp.
Ainslie Corp.
Amatom Electronic Hardware Co. Inc.
Associated Co., Inc.
California Aircraft Products
Clark-Aiken Co., The
Dayton Mfg. Co., Inc.
Dean & Benson Research Inc.
***DIVERSEY ENGRG. CO.**
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Flexonics Corp.
Henry & Miller Industries, Inc.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kling Metal Spinning & Stamping Co.
Longren Aircraft Co., Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
***PHOENIX PRODUCTS CO.**
Revere Copper & Brass Inc.
Roland Teiner Co. Inc.
Seamless Products Co., Inc.
Solar Aircraft Co.
Spincraft, Inc.
Suffolk Products Corp.
Superior Spinning & Stamping Co.
***C. W. TORNGREN CO., INC.**
***UNITED AIRCRAFT PRODUCTS, INC.**
United States Chemical Milling Corp.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Trimmings

A&P Metal Products Mfg. Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
General Railway Signal Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
Winder Aircraft Corp. of Fla.

METAL STOCK, POROUS BEARING

Amplex Div.-Chrysler Corp.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
St. Marys Carbon Co.

METAL STOCK, THERMOSTATIC

American Silver Co.
Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
Metals & Controls Corp.

METAL TREATING

Aerodex, Inc.
American Car & Foundry Div., ACF Industries, Inc.
Barium & Chemicals, Inc.
California Aircraft Products
***COOPER DEVELOPMENT CORP.**
J. P. DeVine Mfg. Co.
Drilube Co.
General Railway Signal Co.
Goodyear Aircraft Corp.
Hamilton Watch Co., Military Products Div.
Hart Metal Products Corp.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Longren Aircraft Co., Inc.
Modglin Co. Inc.
National Forge & Ordnance Co.
Papesch & Kolstad, Inc.
Parish Pressed Steel, Div.-Dana Corp.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rodney Metals Inc.
Skinner Precision Products
Standard Metals Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
Turco Products, Inc.
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
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Aeronca Mfg. Corp.

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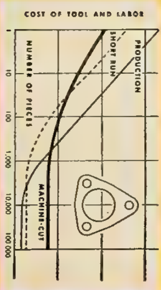

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COMPANY________________
STREET________________

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American Car & Foundry Div., ACF Industries,
*AMERICAN MACHINE & FOUNDRY CO.
[illegible] Corp.
Asscoiated Co., Inc.
Basic Tool Industries, Inc.
Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Cromer Mfg. & Engrg., Inc.
J. P. DeVine Mfg. Co.
*DIVERSEY ENGRG. CO.
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Goodyear Aircraft Corp
Hahn & Clay
Heldor Mfg. Co., Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
*LAVELLE AIRCRAFT CORP.
Longren Aircraft Co., Inc.
Luria Engrg. Co.
*LYCOMING DIV., AVCO MFG. CORP.
Machine Engrg. Co. Inc.
R. C. Mahon Co., The
Modglin Co. Inc.
National Coil Co.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Opelika Welding, Machine, & Supply Inc.
Parish Pressed Steel, Div.-Dana Corp.
Paul & Beekman, Inc.
Peterson & Neville Inc.
Republic Aviation Corp., Guided Missiles Div.
Royal Industries, Inc.
Ryan Aeronautical Co.
*RYAN INDUSTRIES
St. Regis Paper Co.
Shaw Metal Products Corp.
T. W. & C. B. Sheridan Co.
Solar Aircraft Co.
Tapered Air Products Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Titanium Metals Corp. of America
Twin Coach Co.-Aircraft Div.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Weber Aircraft Corp.
Western Arc Welding, Inc.
Wheland Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

MOLDERS, PLASTIC

Aerolite Electronics Corp.
Airflyte Electronics Co.
Alden Products Co.
Allied Plastics Supply Corp.
American Aerophysics Corp.
American Agile Corp.
Calfibe Co., Inc.
Connector Corp.
Dale Products, Inc.
Dayton Aircraft Products, Inc.
Dimco-Gray Co.
Dittmore-Freimuth Corp.
Eco Engrg. Co.
Electric Auto-Lite Co., The
Electro Development Co.
Emeloid Co., Inc., The
Emerson Plastics Corp.
Erie Resistor Corp.
Fluorocarbon Co., Inc., The
Garde Mfg. Co.
General Railway Signal Co.
Goodyear Aircraft Corp.
Walter J. Hyatt Co., The
Hydro Molding Co. Inc.
Joclin Mfg. Co.
Jodee Plastics Co.
*LONE STAR PLASTICS CO. INC.
Modglin Co. Inc.
J. J. Monaghan Co., Inc.
Olympic Plastics Co., Inc.
Resdel Corp.
Silicone Insulation, Inc.
Skydyne Inc.
Sparta Mfg. Co.
Swedlow Plastics Co.
Sylvania Electric Products Inc., Parts Div.
Thompson Products, Inc.
Waterbury Companies, Inc

MOLYBDENUM

American Silver Co.
Anachrome Corp.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
P. R. Mallory & Co. Inc.
Marquardt Aircraft Co.

MONEL

American Silver Co.
American Welding & Mfg. Co., The
Belmont Smelting & Refining Works, Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
G. M. Dykes Iron Works, Inc.
Hahn & Clay

NAMEPLATES

Acromark Co., The
Aerodex, Inc.
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Atlantic Engravers, Inc.
Bendix Aviation Corp., York Div.
W. H. Brady Co.
Canadian Radium & Uranium Corp.
Cleveland Metal Specialties Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Electric Auto-Lite Co., The
Emeloid Co. Inc., The
Emerson Plastics Corp.
Erie Resistor Corp.
Hoover Electronics Co.
Industrial Engravers Inc.
Norsid Mfg. Co., Inc., The
Walter K. Jaros, Aircrafters
Jodee Plastics Co.
Lytle Engrg. & Mfg. Co.
Meyercord Corp.
Park Nameplate Co., Inc.
Rodney Metals Inc.
Roovers-Lotson Corp.
Skinner Precision Products
Sohl Co., The
South Shore Nameplate Inc.
Techniques, Inc.
Topflight Corp.
E. F. Twomey Co., Inc.
United States Radium Corp.
Virginia Plak Co.

NAVIGATION DOMES

*BAUSCH & LOMB OPTICAL CO.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Emerson Plastics Corp.
Goodyear Aircraft Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Microwave Electronics Div., Sperry Gyroscope Co.
Sohl Co., The
Swedlow Plastics Co.
H. I. Thompson Fiber Glass Co.
Universal Unlimited, Inc.

NICKEL

Accurate Specialties Co., Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Silver Co.
Belmont Smelting & Refining Works, Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Cohan Epner Co. Inc.
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Leach & Garner Co., Industrial Div.
Sel-Rex Corp.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America

NUCLEAR SHIELDING, LEAD

*AMERICAN MACHINE & FOUNDRY CO.
Anchor Metal Co. Inc.
Delta Chemical Works, Inc.
Division Lead Co.
G. W. Galloway Co.
Gasket, Packing & Specialty Co., Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Zippertubing Co., The

NUTS, SELF-LOCKING

Aerotron Supply Co.
*AMERICAN MACHINE & FOUNDRY CO.
Boots Aircraft Nut Corp.
Briles Mfg.
Circon Component Corp.
*COOPER DEVELOPMENT CORP.
Corbin Products Div.
R. C. Dudek & Co.
Dumont Aviation Associates
Eaton Mfg. Co.
Elastic Stop Nut Corp. of America
General Cement Mfg. Co., Div.-Textron Inc.
Goe Engrg. Co.
Heldor Mfg. Co., Inc.
Horst Engrg. & Mfg. Co.
Hydro Molding Co. Inc.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kemp Inc.
Nutt-Shel Co.
Republic Steel Corp.
Rosan, Inc.
Tinnerman Products, Inc.
United-Carr Fastener Corp.

OXIDE, ALUMINUM

Aluminum Corp. of America
Anachrome Corp.
Anadite Inc.
B G Corp., The
Corning Glass Works
Delta Chemical Works, Inc.
Diamonite Products Mfg. Co.
Wilbur B. Driver Co.
Electronic Mechanics, Inc.
Morganite, Inc.
Chester Morton Electronics Corp.
Norton Co.
Thermo Materials, Inc.
Western Gold & Platinum

PAINT, METALLIC

Amercoat Corp.
Anachrome Corp.
Avondale Co., The
Samuel Cabot Inc.
Delta Chemical Works, Inc.
Fidelity Chemical Products Corp.
General Cement Mfg. Co., Div.-Textron Inc.
Handy & Harman
Industrial Metal Protectives, Inc.
Krylon, Inc.
Luminous Resins Inc.
Midland Paint & Varnish Co., The
Vorac Co., The

PALLADIUM

American Silver Co.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Cohan Epner Co. Inc.
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Eastern Smelting & Refining Corp.
Electro Tec Corp., Virginia Div.
Engelhard Industries Inc., D. E. Makepeace Div.
Gibson Electric Co.
Handy & Harman
Harper-Leader, Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Precision Electroplating Co.
Sel-Rex Corp.
Standard Metals Corp.
Tricon Mfg. Co.
Western Gold & Platinum

PHENOLICS

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Aircraft Standards, Inc.
Allied Plastics Supply Corp.
American Aerophysics Corp.
Auburn Mfg. Co., The
N. S. Baer Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Delta Chemical Works, Inc.
Dow Chemical Co., The
Eljay Corp.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Hastings Plastics Inc.
Illumitronic Engrg. Co.
Joclin Mfg. Co.
Jodee Plastics Co.
Lebec Chemical Corp.
Marblette Corp., The
New England Laminates Co., Inc.
Olympic Plastics Co., Inc.
Pacific Moulded Products Co.
Print Loid, Inc.
Reichhold Chemicals, Inc.
Rogers Corp.
St. Regis Paper Co.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Superior Carbon Products, Inc.
Swedlow Plastics Co.
Synthane Corp.
United Supply Co.
Vlchek Tool Co., The
Waterbury Companies, Inc.
Westlake Plastics, CrystalX Corp.

PINS, TUBULAR

American Brass Co., The
Century Fasteners Corp.
Champion Airquipment Inc.
Connector Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corbin Products Div.
Diamonite Products Div.
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
Fromson Orban Co., Inc.
Walter K. Jaros, Aircrafters
Keystone Electronics Corp.

Luminous Resins Inc.
Metal Forming Corp.
Orange Roller Bearing Co., Inc.
Roll Formed Products Co.
Standard Pressed Steel Co.
United States Steel Corp.

PLASTIC

Allied Plastics Supply Corp.
Amercian Aerophysics Corp.
Auburn Mfg. Co., The
Bios Labs., Inc.
Crown Industrial Products Co.
Crystal-X Corp.
Duracote Corp.
Electric Auto-Lite Co., The
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Gunnar Laboratories
Hammett Electric Co.
Hydro Molding Co. Inc.
Illumitronic Engrg. Co.
Jodee Plastics Co.
Walter Lee Chemical Corp.
McMillan Industrial Corp.
Merix Chemical Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Plastic Age Sales, Inc.
St. Regis Paper Co.
Swedlow Plastics Co.
Synthane Corp.
Topper Mfg. Co., Inc.
Truxton Industries, Inc.
Westlake Plastics, CrystalX Corp.

Acrylic

Allied Plastics Supply Corp.
Aristocrat Plastics, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bios Labs., Inc.
*BROOK MOLDING CORP.
Chicago Molded Products Corp.
Crystal-X Corp.
Eljay Corp.
Emerson Plastics Corp.
Engineered Plastics, Inc.
General Cement Mfg. Co., Div.-Textron Inc.
Illumitronic Engrg. Co.
Jodee Plastics Co.
Thomas J. Long, Inc.
Plastic Age Sales, Inc.
Swedlow Plastics Co.
Truxton Industries, Inc.
United Supply Co.
Waterbury Companies, Inc.
Westlake Plastics, CrystalX Corp.

Allyls

Bios Labs., Inc.
Crystal-X Corp.
Emerson Plastics Corp.
General Cement Mfg. Co., Div.-Textron Inc.
Plastic Age Sales, Inc.
Swedlow Plastics Co.

Cellulose Acetate

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
N. S. Baer Co.
Bios Labs., Inc.
*BROOK MOLDING CORP.
Chicago Molded Products Corp.
Crystal-X Corp.
Eastman Kodak Corp.
Emerson Plastics Corp.
General Gasket Inc.
Jodee Plastics Co.
Thomas J. Long, Inc.
New England Tape Co. Inc.
Plastic Age Sales, Inc.
Truxton Industries, Inc.
Waterbury Companies, Inc.
Westlake Plastics, CrystalX Corp.

Cellulose Acetate Butyrate

Allied Plastics Supply Corp.
Aristocrat Plastics, Inc.
Auburn Mfg. Co., The
N. S. Baer Co.
Bios Labs., Inc.
*BROOK MOLDING CORP.
Chicago Molded Products Corp.
Eastman Kodak Corp.
Emerson Plastics Corp.
Fidelity Chemical Products Corp.
General Gasket Inc.
General Plastics Corp. of Indiana
Jodee Plastics Co.
New England Tape Co. Inc.
Plastic Age Sales, Inc.
Seal-Peel, Inc.
Truxton Industries, Inc.
Waterbury Companies, Inc.
Western Coating Co.
Westlake Plastics, CrystalX Corp.

Cellulose Nitrate

Allied Plastics Supply Corp.
Bios Labs., Inc.
Chicago Molded Products Corp.
General Gasket Inc.
Hercules Powder Co.
Horsey, Robson & Co., Inc.
Jodee Plastics Co.
Plastic Age Sales, Inc.
Science House, Inc.

Ceramic-Plastic Combinations

Allied Plastics Supply Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bendix Products Div., Bendix Aviation Corp.
Bios Labs., Inc.
Electric Auto-Lite Co., The
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Joclin Mfg. Co.
Lebec Chemical Corp.
McMillan Industrial Corp.
Plastic Age Sales, Inc.
Reichhold Chemicals, Inc.
Resdel Corp.
Rogers Corp.
Topper Mfg. Co., Inc.

Epoxy Resins

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Aircraft Standards, Inc.
Allied Plastics Supply Corp.
Aries Laboratories, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
N. S. Baer Co.
Carl Biggs Co.
Bios Labs., Inc.
Cordo Molding Products, Inc.
Dennis Chemical Co.
Dow Chemical Co., The
Duracote Corp.
Electric Power Door Co., Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Furane Plastics, Inc.
Hastings Plastics Inc.
Joclin Mfg. Co.
Lamtex Industries, Inc.
Marblette Corp., The
New England Tape Co. Inc.
Plastic Age Sales, Inc.
Quick Charge Corp.
Resdel Corp.
St. Regis Paper Co.
Smooth-On Mfg. Co.
Superior Carbon Products, Inc.
Swedlow Plastics Co.
Synthane Corp.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Truxton Industries, Inc.
X-Pando Corp.

Ethyl Cellulose

Allied Plastics Supply Corp.
Bios Labs., Inc.
*BROOK MOLDING CORP.
Chicago Molded Products Corp.
Crystal-X Corp.
Fidelity Chemical Products Corp.
Hercules Powder Co.
Jodee Plastics Co.
Plastic Age Sales, Inc.
Seal-Peel, Inc.
Waterbury Companies, Inc.
Western Coating Co.
Westlake Plastics, CrystalX Corp.

Fiber Glass

Aircraft Standards, Inc.
Allied Plastics Supply Corp.
Amercoat Corp.
Aristocrat Plastics, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
*BROOK MOLDING CORP.
Calfibe Co., Inc.
Coast Mfg. & Supply Co.
Cordo Molding Products, Inc.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Duracote Corp.
Emerson Plastics Corp.
Garrett Corp., The, Air Cruisers Div.
Goodyear Aircraft Corp.
Hampden Brass & Aluminum Co.
Hastings Plastics Inc.
Joclin Mfg. Co.
Jodee Plastics Co.
D. S. Kennedy & Co.
Walter Kidde & Co., Inc., Aviation Div.
Lamtex Industries, Inc.
McMillan Industrial Corp.
New England Laminates Co., Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Plastics Age Sales, Inc.
Quick Charge Corp.
Resdel Corp.
St. Regis Paper Co.
Saylor Electric Products Corp.
Skydyne Inc.
Swedlow Plastics Co.
H. I. Thompson Fiber Glass Co.
Thompson Products, Inc.
Truxton Industries, Inc.
Waterbury Companies, Inc.

Fluorocarbons

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Bios Labs., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crane Packing Co.
Crystal-X Corp.
Dixon Corp.
Electric Power Door Co., Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Enflo Corp.
Flexrock Co.
Fluorocarbon Co. Inc., The
General Gasket Inc.
General Plastics Corp. of New Jersey
Joclin Mfg. Co.
Jodee Plastics Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Plastic Age Sales, Inc.
Reichhold Chemicals, Inc.
Resistoflex Corp.
Rex Corp., The
Rogers Corp.
Sparta Mfg. Co.
Topper Mfg. Co., Inc.
Westlake Plastics, CrystalX Corp.

Melamine Formaldehyde

Allied Plastics Supply Corp.
*BROOK MOLDING CORP.
Chicago Molded Products Corp.
Continental Connector Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Emerson Plastics Corp.
Engineered Plastics, Inc.
Lebec Chemical Corp.
Plastic Age Sales, Inc.
St. Regis Paper Co.
Spaulding Fibre Co., Inc.
Synthane Corp.
Truxton Industries, Inc.
Waterbury Companies, Inc.

Mica-Plastic Combinations

Allied Plastics Supply Corp.
*BROOK MOLDING CORP.
Connector Corp.
Continental Connector Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Emerson Plastics Corp.
Magnetic Shield Div.-Perfection Mica Co.
Mica Fabricating Co.
New England Laminates Co., Inc.
Penn Fibre & Specialty Co., Inc.
Plastic Age Sales, Inc.
Reichhold Chemicals, Inc.

Phenolics

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Aircraft Standards, Inc.
Allied Plastics Supply Corp.
American Brake Shoe Co.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
N. S. Baer Co.
Bios Labs., Inc.
*BROOK MOLDING CORP.
Chicago Molded Products Corp.
Connector Corp.
Continental Connector Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Dow Chemical Co., The
Eljay Corp.
Emerson Plastics Corp.
Engineered Plastics, Inc.
Gatke Corp.
Goodyear Aircraft Corp.
Hastings Plastics Inc.
Illumitronic Engrg. Co.
Joclin Mfg. Co.
Jodee Plastics Co.
Lebec Chemical Corp.
Thomas J. Long, Inc.
Marblette Corp., The
Mica Fabricating Co.
New England Laminates Co., Inc.
Pacific Moulded Products Co.
Penn Fibre & Specialty Co., Inc.
Plastic Age Sales, Inc.
Reichhold Chemicals, Inc.
Rogers Corp.

- St. Regis Paper Co.
- Science House, Inc.
- Spaulding Fibre Co., Inc.
- Superior Carbon Products, Inc.
- Swedlow Plastics Co.
- Synthane Corp.
- Waterbury Companies, Inc.
- ***WESTINGHOUSE ELECTRIC CORP.**

Polyester

- Allied Plastics Supply Corp.
- Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
- Auburn Mfg. Co., The
- N. S. Baer Co.
- Bios Labs., Inc.
- ***BROOK MOLDING CORP.**
- Chicago Molded Products Corp.
- Continental Diamond Fibre Corp., Sub.-The Budd Co.
- Emerson & Cuming, Inc.
- Emerson Plastics Corp.
- Garrett Corp., The, Air Cruisers Div.
- Goodyear Aircraft Corp.
- Hastings Plastics Inc.
- Koppers Co., Inc.
- Lamtex Industries Inc.
- Mica Fabricating Co.
- Neosil Products Co.
- Penn Fibre & Specialty Co., Inc.
- Plastic Age Sales, Inc.
- Resdel Corp.
- St. Regis Paper Co.
- Science House, Inc.
- Sierracin Corp., The
- Smooth-On Mfg. Co.
- Swedlow Plastics Co.
- Telectro Industries Corp.
- Truxton Industries, Inc.

Polyethylene

- Allied Plastics Supply Corp.
- American Agile Corp.
- Aristocrat Plastics, Inc.
- Auburn Mfg. Co., The
- Bios Labs., Inc.
- ***BROOK MOLDING CORP.**
- Catalin Corp. of America
- Chicago Molded Products Corp.
- Crystal-X Corp.
- Dow Chemical Co., The
- Emeloid Co. Inc., The
- Emerson Plastics Corp.
- Garrett Corp., The, Air Cruisers Div.
- General Gasket Inc.
- General Plastics Corp. of Indiana
- Goodyear Aircraft Corp.
- Hercules Powder Co.
- Illumitronic Engrg. Co.
- Jodee Plastics Co.
- Koppers Co., Inc.
- Thomas J. Long, Inc.
- Mica Fabricating Co.
- New England Tape Co. Inc.
- Olin Mathieson Chemical Corp., High Energy Fuels Div.
- Plastic Age Sales, Inc.
- Reeves Brothers Inc., Vulcan Rubber Products Div.
- Rex Corp., The
- St. Regis Paper Co.
- Science House, Inc.
- Truxton Industries Inc.
- Varflex Corp.
- Waterbury Companies, Inc.
- Westlake Plactics, CrystalX Corp.

Polystyrene

- Allied Plastics Supply Corp.
- Aristocrat Plastics Inc.
- Bios Labs., Inc.
- ***BROOK MOLDING CORP.**
- Catalin Corp. of America
- Chicago Molded Products Corp.
- Crystal-X Corp.
- Dow Chemical Co., The
- Emeloid Co. Inc., The
- Emerson & Cuming, Inc.
- Emerson Plastics Corp.
- Garrett Corp., The, Air Cruisers Div.
- General Plastics Corp. of Indiana
- Gunnar Laboratories
- Illumitronic Engrg. Co.
- Jodee Plastics Co.
- Mica Fabricating Co.
- New England Tape Co. Inc.
- Plastic Age Sales, Inc.
- Rex Corp., The
- St. Regis Paper Co.
- Swedlow Plastics Co.
- Topper Mfg. Co., Inc.
- Truxton Industries, Inc.
- Waterbury Companies Inc.
- Westlake Plastics, CrystalX Corp.

Polytrifluorochlorethylene

- Allied Plastics Supply Corp.
- Aristocrat Plastics, Inc.
- Auburn Mfg. Co., The
- Bios Labs., Inc.
- ***BROOK MOLDING CORP.**
- Chicago Gasket Co.
- Crystal-X Corp.
- Emerson Plastics Corp.
- Fluorocarbon Co. Inc., The
- General Gasket Inc.
- General Plastics Corp. of New Jersey
- Halogen Insulator & Seal Corp
- Joclin Mfg. Co.
- Jodee Plastics Co.
- Walter Lee Chemical Corp.
- Plastic Age Sales, Inc.
- Resistoflex Corp.
- Rex Corp., The
- Westlake Plastics, CrystalX Corp.

Reinforced

- Air Logistics Corp.
- Allied Plastics Supply Corp.
- Amercoat Corp.
- Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
- **Bios Labs., Inc.**
- ***BROOK MOLDING CORP.**
- Calfibe Co., Inc.
- Continental Diamond Fibre Corp., Sub.-The Budd Co.
- ***DALMO VICTOR CO., DIV.-TEXTRON INC.**
- Dayton Aircraft Products, Inc.
- Duracote Corp.
- Emerson & Cuming, Inc.
- Emerson Plastics Corp.
- Enflo Corp.
- Gatke Corp.
- Hampden Brass & Aluminum Co.
- Hastings Plastics Inc.
- Joclin Mfg. Co.
- Lamtex Industries, Inc.
- McMillan Industrial Corp.
- Penn Fibre & Specialty Co., Inc.
- Plastic Age Sales, Inc.
- Resdel Corp.
- Rogers Corp.
- Silicone Insulation, Inc.
- Swedlow Plastics Co.
- Synthane Corp.
- H. I. Thompson Fiber Glass Co.
- Thompson Products, Inc.
- ***WESTINGHOUSE ELECTRIC CORP.**

Silicones

- Allied Plastics Supply Corp.
- Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
- Auburn Mfg. Co., The
- Bios Labs., Inc.
- Continental Diamond Fibre Corp., Sub.-The Budd Co.
- Continental Rubber Works
- Darcoid Co., Inc., The
- Dayton Aircraft Products, Inc.
- Duroyd Gasket Mfg. Co.
- Emerson & Cuming, Inc.
- Emerson Plastics Corp.
- Garrett Corp., The, Air Cruisers Div.
- General Cement Mfg. Co., Div.-Textron Inc.
- General Gasket Inc.
- Isolantite Mfg. Corp.
- Joclin Mfg. Co.
- Pacific Moulded Products Co.
- Plastic Age Sales, Inc.
- Rogers Corp.
- Rubbercraft Corp. of California
- St. Regis Paper Co.
- Silicone Insulation, Inc.
- Silicone Products Dept., General Electric Co.
- Silicones Div.-Union Carbide Corp.
- Swedlow Plastics Co.
- Synthane Corp.
- Varflex Corp.
- Western Felt Works

Styrene

- Allied Plastics Supply Corp.
- Aristocrat Plastics, Inc.
- Bios Labs., Inc.
- ***BROOK MOLDING CORP.**
- Catalin Corp. of America
- Chicago Molded Products Corp.
- Crystal-X Corp.
- Emerson & Cuming, Inc.
- Emerson Plastics Corp.
- Jodee Plastics Co.
- Koppers Co., Inc.
- Plastic Age Sales, Inc.
- Topper Mfg. Co., Inc.
- Truxton Industries, Inc.
- Waterbury Companies, Inc.
- Westlake Plastics, CrystalX Corp.

Tetrafluoroethylene Resin

- Acheson Colloids Co., Div.-Acheson Industries, Inc.
- Allied Plastics Supply Corp.
- Auburn Mfg. Co., The
- Bios Labs., Inc.
- ***BROOK MOLDING CORP.**
- Chicago Gasket Co.
- Chicago Molded Products Corp.
- Crystal-X Corp.
- Eco Engrg Co.
- Emerson Plastics Corp.
- Enflo Corp.
- Flexrock Co.
- Fluorocarbon Co. Inc., The
- Halogen Insulator & Seal Corp.
- Illumitronic Engrg. Co.
- Joclin Mfg. Co.
- Walter Lee Chemical Corp.
- J. E. Menaugh Co.
- Plastic Age Sales, Inc.
- Rex Corp., The
- Science House, Inc.
- Sparta Mfg. Co.

Urea Formaldehyde

- Allied Plastics Supply Corp.
- Bios Labs., Inc.
- ***BROOK MOLDING CORP.**
- Chicago Molded Products Corp.
- Lebec Chemical Corp.
- Plastic Age Sales, Inc.
- Reichhold Chemicals, Inc.
- Waterbury Companies, Inc.

Vinyl

- Allied Plastics Supply Corp.
- Applied Design Co.
- Aristocrat Plastics, Inc.
- Auburn Mfg. Co., The
- Carl Biggs Co.
- Bios Labs., Inc.
- Borden Chemical Co., The, Div.-The Borden Co. Resinite Dept.
- ***BROOK MOLDING CORP.**
- Dennis Chemical Co.
- Duracote Corp.
- Emeloid Co. Inc., The
- Emerson Plastics Corp.
- General Gasket Inc.
- B. F. Goodrich Industrial Products Co.
- Jodee Plastics Co.
- Lebec Chemical Corp.
- Penn Fibre & Specialty Co., Inc.
- Plastic Age Sales, Inc.
- Rubatex Div., Great American Industries Inc.
- Seal-Peel, Inc.
- E. F. Timme & Son, Inc.
- Truxton Industries, Inc.
- Varflex Corp.
- Virginia Plak Co.
- Waterbury Companies, Inc.
- Western Coating Co.
- Westlake Plastics, CrystalX Corp.
- Wrought Washer Mfg. Co.
- Zippertubing Co., The

PLASTICS FABRICATORS AND FINISHERS

- ACF Industries, Inc., Advanced Products Div.
- Accurate Electronics Corp., Dept. D
- Aerolite Electronics Corp.
- Air Logistics Corp.
- Airflyte Electronics Co.
- Allied Engraving & Stamping Co.
- Allied Plastics Supply Corp.
- American Aerophysics Corp.
- American Agile Corp.
- Aristocrat Plastics, Inc.
- Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
- Auburn Mfg. Co., The
- N. S. Baer Co.
- Basic Tool Industries, Inc.
- Calfibe Co., Inc.
- Chicago Gasket Co.
- Chicago Molded Products Corp.
- Connector Corp.
- Continental Diamond Fibre Corp., Sub.-The Budd Co.
- Crane Packing Co.
- Crystal-X Corp.
- Dakota Engrg., Inc.
- Dale Products, Inc.
- ***DALMO VICTOR CO., DIV.-TEXTRON INC.**
- Dayton Aircraft Products, Inc.
- Dayton Mfg. Co., Inc
- Dixon Corp.
- Duracote Corp.
- Dwyer Engrg. Co., Inc.
- Eagle-Picher Co., The
- Elastic Stop Nut Corp. of America
- Electric Power Door Co., Inc.
- Electronic Techniques, Inc.
- Eljay Corp.
- Elm Mfg. Co., Inc.
- Emeloid Co. Inc., The
- Emerson & Cuming, Inc.
- Emerson Plastics Corp.
- Enflo Corp.
- Engineered Plastics, Inc.
- Engineered Products Co., The
- Erie Resistor Corp.
- Flexrock Co.
- Fluorocarbon Co. Inc., The
- Franklin Fibre-Lamitex Corp.
- General Components Inc.
- General Gasket Inc.
- General Plastics Corp. of Indiana
- General Plastics Corp. of New Jersey

Goodyear Aircraft Corp.
Grimes Mfg. Co.
Hammett Electric Co.
Hastings Plastics Inc.
Illumitronic Engrg. Co.
Industrial Engravers Inc.
Joclin Mfg. Co.
Jodee Plastics Co.
Keystone Electronics Corp.
Kurz-Kasch, Inc.
Lamtex Industries, Inc.
Lancaster Glass Corp.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
*LONE STAR PLASTICS CO. INC.
Thomas J. Long, Inc.
Luminous Resins Inc.
Mercury International Industries Inc.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Modglin Co. Inc.
J. J. Monaghan Co., Inc.
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Waterbury Companies, Inc.
Westlake Plastics, CrystalX Corp.
Winder Aircraft Corp. of Fla.
Zippertubing Co., The

PLASTICS, LAMINATED

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Air Logistics Corp.
Aircraft Standards, Inc.
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
American Aerophysics Corp.
American Brake Shoe Co.
Arrowhead Producst, Div.—Federal-Mogul-Bower Bearings, Inc.
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Basic Tool Industries, Inc.
Carl Biggs Co.
Bomyte Co., The
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Connector Corp.
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Dayton Aircraft Products, Inc.
Duracote Corp.
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Electric Auto-Lite Co., The
Elektro-Serv Co.
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Emerson & Cuming, Inc.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Garrett Corp., The, Air Cruisers Div.
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Gatke Corp.
General Gasket Inc.
General Plastics Corp. of New Jersey
Goodyear Aircraft Corp.
Hastings Plastics Inc.
Hays Mfg. Co.
Joclin Mfg. Co.
Walter Kidde & Co., Inc., Aviation Div.
Lamtex Industries, Inc.
La Pointe Industries Inc.
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McMillan Industrial Corp.
Mercury International Industries Inc.
Met-L-Wood Corp.
Mica Corp.
New England Laminates Co., Inc.
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Print Loid, Inc.
Raybestos-Manhattan, Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
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Sierracin, Corp., The
Silicone Insulation, Inc.

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Spaulding Fibre Co., Inc.
Star Engraving Co., Ltd.
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Twix Mfg. Co., Inc.
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Jodee Plastics Co.
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Sohl Co., The
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Westlake Plastics, CrystalX Corp.
Winder Aircraft Corp. of Fla.
Wrought Washer Mfg. Co.

PLATES, METAL OR PLASTIC

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Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
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American Aerophysics Corp.
Aristocrat Plastics, Inc.
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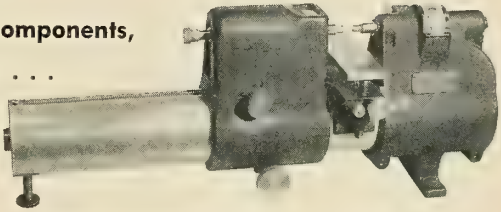
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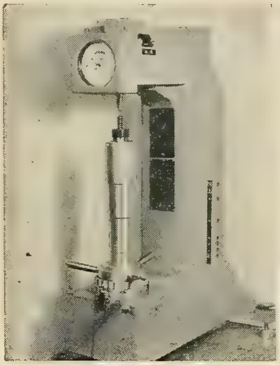
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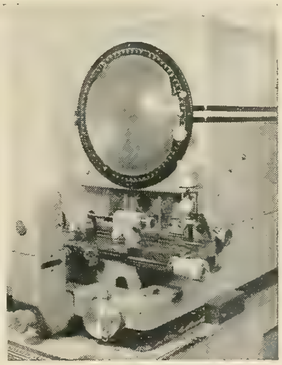
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United States Radium Corp.
Vaccum Metals Corp., Div.-Crucible Steel Co. of America
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Duracote Corp.
Electrofilm, Inc.
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Esso Standard Oil Co.
Fidelity Chemical Products Corp.
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Delta Chemical Works, Inc.
Electronics Corp. of America
Kemlite Laboratories, Inc.
Ultra-Violet Products, Inc.

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Electric Auto-Lite Co., The
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Emerson Plastics Corp.
Enflo Corp.
Garrett Corp., The, Air Cruisers Div.
Goodyear Aircraft Corp.
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Lamtex Industries, Inc.
*LONE STAR PLASTICS CO. INC.
Marblette Corp., The
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New England Laminates Co., Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Olympic Plastics Co., Inc.
Quick Charge Corp.
Republic Aviation Corp., Guided Missiles Div.
Resdel Corp.
Rogers Corp.
Silicone Insulation, Inc.
Swedlow Plastics Co.
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*CORNELIUS CO., THE
*DALMO VICTOR CO., DIV.-TEXTRON INC.
*DIVERSEY ENGRG. CO.
G. W. Galloway Co.
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*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
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Pacific Div.-Bendix Aviation Corp.
Peterson & Neville Inc.
Philips & Davies Inc.
Portland Copper & Tank Works Inc.
Progressive Research & Development Co., Inc.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Thompson Products, Inc.
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Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Warren Mfg. Div., Warren Brothers Roads Co.
Wells Industries Corp.
Wickfield, Inc.

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Bendix Products Div., Bendix Aviation Corp.
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Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries Inc.
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*CORNELIUS CO., THE
*DALMO VICTOR CO., DIV.—TEXTRON INC.
*DIVERSEY ENGRG. CO.
*GREER HYDRAULICS, INC.
Hydra-Power Corp.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.—Kaiser Industries Corp.
Kelsey-Hayes Co.
Walter Kidde & Co., Inc., Aviation Div.
Pacific Div.—Bendix Aviation Corp.
Philips & Davies Inc.
Portland Copper & Tank Works, Inc.
Progressive Research & Development Co., Inc.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Thompson Products, Inc.
Vinson Mfg. Co., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
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Acheson Colloids Co., Div.-Acheson Industries, Inc.
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Armstrong Products Co.
Carl Biggs Co.
Delta Chemical Works, Inc.
Drilube Co.
Emerson & Cuming, Inc.
Hastings Plastics, Inc.
Lamtex Industries, Inc.
Lebec Chemical Corp.
Marblette Corp., The
Narmco Resins & Coatings Co.
New England Tape Co., Inc.
Silicones Div.-Union Carbide Corp.
Smooth-On Mfg. Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.

RESINS, ENCAPSULATING

Airflyte Electronics Co.
Armstrong Products Co.
Carl Biggs Co.
Delta Chemical Works, Inc.
Emerson & Cuming, Inc.
Hastings Plastics, Inc.
Marblette Corp., The
Narmco Resins & Coatings Co.
National Engr. Products, Inc.
New England Tape Co., Inc.
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Silicones Div.-Union Carbide Corp.
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Silicones Div.-Union Carbide Corp.
Smooth-On Mfg. Co.
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Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
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Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
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O & M Machine Co., Inc.
Republic Aviation Corp., Guided Missiles Div.
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Bram Metallurgical & Chemical Co.
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Delta Chemical Works, Inc.
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Hamilton Watch Co., Military Products Div.
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RINGS

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Anchor Packing Co., The
Auburn Mfg. Co., The
Bridgwater Machine Co.
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Federal Machine Co., Inc.
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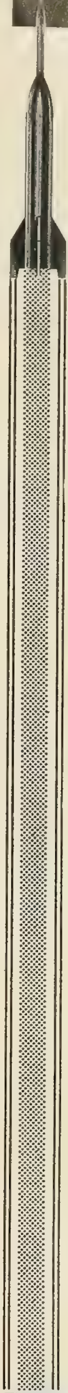

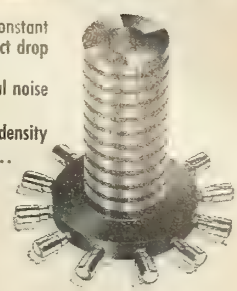

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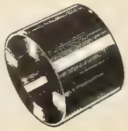

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Topper Mfg. Co., Inc.

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Briles Mfg.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Circon Component Corp.
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Dumont Aircraft Fitting Co.
Dumont Aviation Associates
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B. F. Goodrich Aviation Products
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Hi-Shear Rivet Tool Co.
Huck Mfg. Co.
Walter K. Jaros, Aircrafters
R. I. Metpro, Inc.
Reed & Prince Mfg. Co.
Republic Steel Corp.
Southco Div., South Chester Corp.
United Shoe Machinery Corp.

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Propellex Chemical Corp.
Southco Div., South Chester Corp.
***TOWNSEND CO., CHERRY RIVET DIV.**
United Supply Co.

ROCKETS

American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Fulton-Irgon Corp., The
G. W. Galloway Co.
Goodyear Aircraft Corp.
***GRAND CENTRAL ROCKET CO.**
Hercules Powder Co.
Walter K. Jaros, Aircrafters
McCormick Selph Associates
Oerlikon Tool & Arms Corp. of America
Pacific Tube Co.
Propellex Chemical Corp.
Republic Aviation Corp., Guided Missiles Div.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ryan Aeronautical Co.
Stanley Aviation Corp.
Talco Engrg. Co., The
Turbo Dynamics Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

RODS, TUNGSTEN

Bergen Carbide Co.
Bram Metallurgical & Chemical Co.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
Hammett Electric Co.
Micro-Wire Tungsten & Molybdenum Products
Size Control Company
Superior Carbon Products, Inc.

RUBBER

Allied Plastics Supply Corp.
Anchor Packing Co., The
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Chicago-Allis Mfg. Corp.
Continental Rubber Works
Duroyd Gasket Mfg. Co.
Emerson & Cuming, Inc.
General Gasket Inc.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Roberts Toledo Rubber Co., The
Rubbercraft Corp. of California
Silicones Div.-Union Carbide Corp.
Topper Mfg. Co., Inc.

Conductive

Auburn Mfg. Co., The
Bios Labs., Inc.
Connecticut Hard Rubber Co., The
Continental Rubber Works
Emerson & Cuming, Inc.
General Gasket Inc.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Roberts Toledo Rubber Co., The
Rogers Corp.
Rubbercraft Corp. of California
Silicones Div.-Union Carbide Corp.

Hard

Allied Plastics Supply Corp.
Bios Labs., Inc.
Emerson Plastics Corp.
Raybestos-Manhattan, Inc.
Roberts Toledo Rubber Co., The
Rogers Corp.
Rubbercraft Corp. of California

Insulation

Allied Plastics Supply Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Bacon Industries, Inc.
Bios Labs., Inc.
Connecticut Hard Rubber Co., The
Continental Rubber Works
Duroyd Gasket Mfg. Co.
B. F. Goodrich Aviation Products
Johns-Mansville Dutch Brand Div.
Raybestos-Manhattan, Inc.
Roberts Toledo Rubber Co., The
Rogers Corp.
Rubatex Div. Great American Industries Inc.
Rubbercraft Corp. of California
Silicones Div.-Union Carbide Corp.
Varflex Corp.

Natural

Allied Plastics Supply Corp.
Anchor Packing Co., The
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Bios Labs., Inc.
Chicago-Allis Mfg. Corp.
Continental Rubber Works
Darcoid Co., Inc., The
Duroyd Gasket Mfg. Co.
General Gasket Inc.
B. F. Goodrich Aviation Products
Johns-Mansville Dutch Brand Div.
Neosil Products Co.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Roberts Toledo Rubber Co., The
Rogers Corp.
Rubatex Div., Great American Industries Inc.
Rubbercraft Corp. of California

Synthetic

Allied Plastics Supply Corp.
Anchor Packing Co., The
Auburn Mfg. Co., The
Bacon Industries, Inc.
Bios Labs., Inc.
Chicago-Allis Mfg. Corp.
Connecticut Hard Rubber Co., The
Continental Rubber Works
Darcoid Co., Inc., The
Duroyd Gasket Mfg. Co.
General Gasket Inc.
B. F. Goodrich Aviation Products
Johns-Mansville Dutch Brand Div.
Neosil Products Co.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
Roberts Toledo Rubber Co., The
Rogers Corp.
Rubatex Div., Great American Industries Inc.
Rubbercraft Corp. of California
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Topper Mfg. Co., Inc.

RUDDERS

Associated Co., Inc.
Basic Tool Industries, Inc.
***DIVERSEY ENGRG. CO.**
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
***LAVELLE AIRCRAFT CORP.**
Longren Aircraft Co., Inc.
Republic Aviation Corp., Guided Missiles Div.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Wheland Co., The
Winder Aircraft Corp. of Fla.

SCREW, MACHINE PRODUCTS

Abalon Precision Mfg. Corp.
Abbott Screw & Mfg. Co.
Acme Industrial Co.
Aerotron Supply Co.
Affiliated Screw Products Co.
Airborne Research & Development Corp.
Aircraft Fitting Co., The
Allied Plastics Supply Corp.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
Amatom Electronic Hardware Co. Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Non Gran Bronze Co.
American Screw Co.
American Standard Products, Inc.
Arnolt Corp.
Auburn Spark Plug Co., Inc.
Bendix Products Div., Bendix Aviation Corp.
Bergen Carbide Co.
Bland Burner Co., The
Briles Mfg.
J. H. Bunnell & Co.
Century Fasteners Corp.
Champion Airquipment Inc.
Chicago Screw Co., The, Div.-Standard Screw Co.
Circon Component Corp.
Connector Corp. of America
Continental Connector Corp.
Corbin Products Div.
Dalmore Corp.
Dayton Mfg. Co., Inc.
Dill Mfg. Co., The
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Eco Engrg. Co.
Eddington Metal Specialty Co.
Electronic Techniques, Inc.
Engineered Products Co., The
Federal Screw Products Inc.
Fluorocarbon Co. Inc., The
Freeman Co., The
Geartronics Corp.
General Components Inc.
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
Goe Engrg. Co.
Hamilton Watch Co., Military Products Div.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Harvey Aluminum
Alfred Hofmann & Co.
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Lamson & Sessions Co., The
Leach & Garner Co., Industrial Div.
Litton Industries, Components Div.
J. A. Maurer, Inc.
Mercury Air Parts Co., Inc.
Henry & Miller Industries, Inc.
J. I. Morris Co.
Napoleon Products Co., The
National Airoil Burner Co.
National Lock Co.
Orange Roller Bearing Co., Inc.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
H. K. Porter Inc.
Precise Instrument Parts Co., A Corp.
Puritan Compressed Gas Corp., Aviation Div.
Research Development Mfg. Inc.
***SCREW PRODUCTS CORP. OF AMERICA**
Seamless Products Co., Inc.
Sinclair Mfg. Co.
Skinner Precision Products
Specialties Mfg. Co., Inc.
Herman D. Steel Co.
Wm. Steinen Mfg. Co.
Standard Locknut & Lockwasher Inc.
Standard Pressed Steel Co.
Synthane Corp.
Technical Oil Tool Corp.
Titan Metal Mfg. Co.
Torrington Co., The
United Mfg. Co., The
United Supply Co.
Uniwave, Inc.
Vemaline Products Co.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Waltham Screw Co.
Wenco Mfg. Co.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.
Westfield Metal Products Co., Inc.
Wilmar Mfg. Co., Inc.
Winder Aircraft Corp. of Fla.
J. H. Winn Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

SCREWS, SELF-TAPPING

Abbott Screw & Mfg. Co.
Aerotron Supply Co.
Affiliated Screw Products Co.
Allmetal Screw Products Co., Inc.
American Screw Co.
Briles Mfg.
Century Fasteners Corp.
Corbin Products Div.
Dumont Aviation Associates
Federal Screw Products Inc.
Walter K. Jaros, Aircrafters
Lamson & Sessions Co., The
Mercury Air Parts Co., Inc.
National Lock Co.
Reed & Prince Mfg. Co.
Torrington Co., The
Waldom Electronics Inc.
J. H. Winn Inc.

SCREWS, SET

Abbott Screw & Mfg. Co.

Aerotron Supply Co.
Affiliated Screw Products Co.
Allen Mfg. Co.
Allmetal Screw Products Co., Inc.
Briles Mfg.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Chicago Screw Co., The, Div.-Standard Screw Co.
Corbin Products Div.
Danly Machine Specialties, Inc.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Federal Screw Products Inc.
General Cement Mfg. Co., Div.—Textron Inc.
***HARTFORD MACHINE SCREW CO., DIV.—STANDARD SCREW CO.**
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Mercury Air Parts Co., Inc.
National Lock Co.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Reed & Prince Mfg. Co.
Republic Steel Corp.
Standard Pressed Steel Co.
Waldom Electronics Inc.
Western Automatic Machine Screw Co., Div.—Standard Screw Co.

SCREWS, STANDARD

Abbott Screw & Mfg. Co.
Alden Systems Co.
Allen Mfg. Co.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
American Screw Co.
Bland Burner Co., The
Briles Mfg.
Century Fasteners Corp.
Chicago Screw Co., The, Div.—Standard Screw Co.
Circon Component Corp.
Corbin Products Div.
Danly Machine Specialties, Inc.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Federal Screw Products Inc.
General Cement Mfg. Co., Div.—Textron Inc.
***HARTFORD MACHINE SCREW CO., DIV.—STANDARD SCREW CO.**
Walter K. Jaros, Aircrafters
Lamson & Sessions Co., The
Mercury Air Parts Co., Inc.
National Lock Co.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Reed & Prince Mfg. Co.
Republic Steel Corp.
Herman D. Steel Co.
Torrington Co., The
Waldom Electronics Inc.
Western Automatic Machine Screw Co., Div.—Standard Screw Co.
Westfield Metal Products Co., Inc.

SEALERS, FUEL AND OIL TANK

Drilube Co.
Dumont Aviation Associates
Horsey, Robson & Co., Inc.
Turco Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Shoe Machinery Corp.

SEALERS, NUCLEAR

Conax Corp.
Nuclear Corp. of America, Inc.
Silicones Div.—Union Carbide Corp.
Telectro Industries Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**

SEALERS, PROTECTIVE

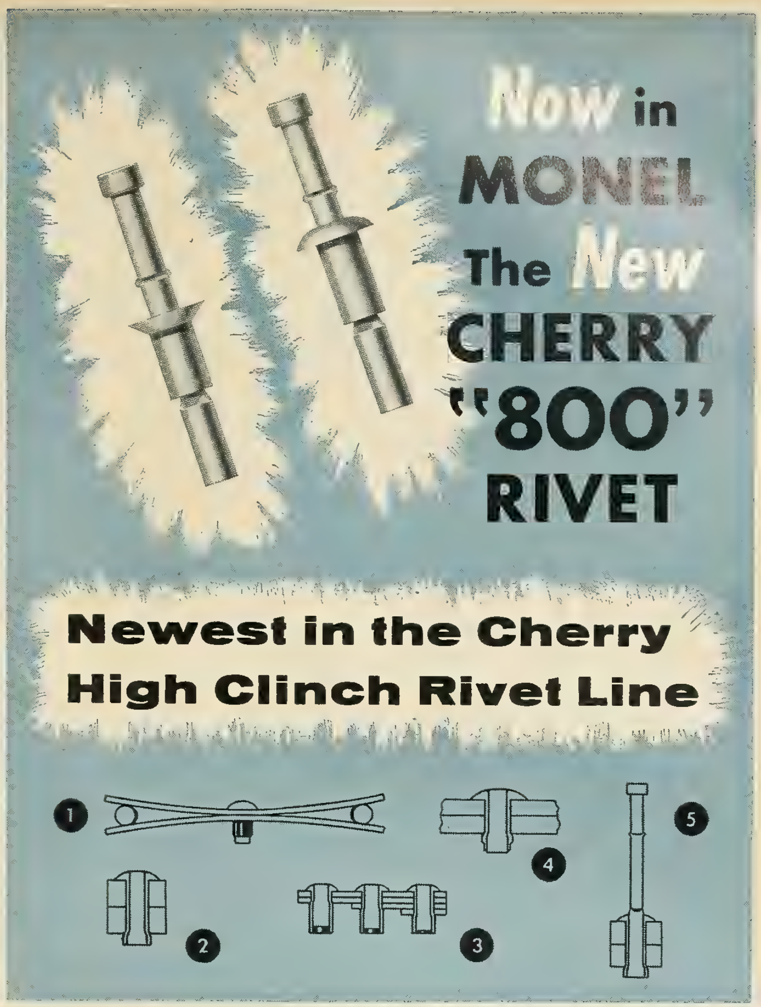
Barium & Chemicals, Inc.
Dennis Chemical Co.
General Cable Corp.
Silicones Div.—Union Carbide Corp.
United Shoe Machinery Corp.

SEALING, SERVICE, HERMETIC

Automatic & Precision Mfg. Co.
Elgin Micronics, West Coast Div.—Elgin National Watch Co.
Philadelphia Scientific Glass Co.

SEALS

Advanced Products Co., The
Allied Plastics Supply Corp.
Anchor Packing Co., The
Auburn Mfg. Co., The
Bios Labs., Inc.
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.—Clevite Corp.
Consolidated Electrodynamics Corp.
Crane Packing Co.
Electrical Industries, Div.—Philips Electronics, Inc.
Emerson Plastics Corp.
Epoxy Products, Inc., Div.—Joseph Waldman & Sons
Fusite Corp.
Green, Tweed & Co.
Kasar Mfg. & Distributing Co., Inc.
Walter Lee Chemical Corp.


Now in
MONEL
The New
CHERRY
"800"
RIVET
Newest in the Cherry High Clinch Rivet Line
1
2
3
4
5

All of the established Cherry High Clinch features are now in the "800" Monel rivets:
(1) high clinch; (2) positive hole fill; (3) wide grip range; (4) uniform stem retention; (5) positive inspection—which now includes grip length stamped on rivet head.

New design concepts are possible with the complete line of Cherry High Clinch rivets. Smaller fasteners—stronger materials—a complete range of temperature and strength applications suited to your problems. The new Cherry "800" in Monel, the "700" in aluminum, and the "600" high-strength, high-temperature rivet in A286 stainless steel give you a complete selection—all in the same proved Cherry High Clinch configuration*.

For technical data on the new Cherry "800" Monel and other Cherry High Clinch rivets, write Townsend Company, Cherry Rivet Division, P. O. Box 2157-Z, Santa Ana, Calif.

*Patents issued and pending

CHERRY RIVET DIVISION
SANTA ANA, CALIFORNIA
Townsend Company
ESTABLISHED 1816 • NEW BRIGHTON, PA.

In Canada: *Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario*

. . . missile frame

Progressive Research & Development Co., Inc.
St. Marys Carbon Co.
Schlegel Mfg. Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
U. S. Hammered Piston Ring Co., Inc.
Victor Mfg. & Gasket Co.

Carbon

Bios Labs., Inc.
Cleveland Graphite Bronze Co., Div.—Clevite Corp.
Graphite Metallizing Corp.
La Pointe Industries Inc.
Magnetic Seal Corp.
Morganite, Inc.
Ohio Carbon Co., The
St. Marys Carbon Co.
Simplex Piston Ring Mfg. Co.
U. S. Hammered Piston Ring Co., Inc.

Ceramic to Metal

Auburn Spark Plug Co., Inc.
Barium & Chemicals, Inc.
Bendix Products Div., Bendix Aviation Corp.
Carl Biggs Co.
Bios Labs., Inc.
Ceramaseal, Inc.
Consolidated Electrodynamics Corp.
Crane Packing Co.
Diamonite Products Mfg. Co.
Edgerton, Germeshausen & Grier, Inc.
Electric Auto-Lite Co., The
Geisler Labs.
Isolantite Mfg. Corp.
Kerns Mfg. Corp.
La Pointe Industries Inc.
Magnetic Seal Corp.
McCormick Selph Associates
Chester Morton Electronics Corp.
D. M. Steward Mfg. Co.
Sylvania Electric Products Inc., Part Div.
Telectro Industries Corp.
Thermo Materials, Inc.
U. S. Hammered Piston Ring Co., Inc.
Wave Particle Corp.
Western Gold & Platinum

Dust Excluder

Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Chicago-Allis Mfg. Corp.
Connecticut Hard Rubber Co., The
Flock Process Co. Inc.
Walter Lee Chemical Corp.
Magnetic Seal Corp.
Schlegel Mfg. Co.
Spincraft, Inc.
U. S. Hammered Piston Ring Co., Inc.
Victor Mfg. & Gasket Co.

Grease and Oil

Advanced Products Co., The
Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Bios Labs., Inc.
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
Dumont Aviation Associates
Graphite Metallizing Corp.
Green, Tweed & Co.
Kasar Mfg. & Distributing Co., Inc.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Magnetic Seal Corp.
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
U. S. Hammered Piston Ring Co., Inc.
Victor Mfg. & Gasket Co.

Hermetic and Pressurized

Auburn Spark Plug Co., Inc.
Coaxial Connector Co., Inc.
Conax Corp.
Demornay-Bonardi
Electrical Industries, Div.-Philips Electronics, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Emerson Plastics Corp.
Flexonics Corp.
Fusite Corp.
Garde Mfg. Co.
Gilmore Industries Inc.
B. F. Goodrich Aviation Products
Joclin Mfg. Co.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
McCormick Selph Associates
Neosil Products Co.
Progressive Research & Development Co., Inc.
Telectro Industries Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.

Hydraulic

Advanced Products Co., The
***AMERICAN MACHINE & FOUNDRY CO.**
Auburn Spark Plug Co., Inc.
Auto-Control Labs., Inc.
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Conax Corp.
Crane Packing Co.
Dumont Aviation Associates
Emerson Plastics Corp.
Fluorocarbon Co. Inc., The
Green, Tweed & Co.
Halogen Insulator & Seal Corp.
E. F. Houghton & Co.
Joclin Mfg. Co.
Kasar Mfg. & Distributing Co., Inc.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Loewy-Hydropress, Div.-Baldwin-Lima-Hamilton
Magnetic Seal Corp.
Oil-Dyne, Inc.
Parker-Hannifin Corp.
Penn Fibre & Specialty Co., Inc.
Progressive Research & Development Co., Inc.
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
Simplex Piston Ring Mfg. Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.

Insulating

Allied Plastic Supply Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Bacon Industries, Inc.
Calfibe Co., Inc.
Conax Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Emerson Plastics Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Franklin Fibre-Lamitex Corp.
Fusite Corp.
Garde Mfg. Co.
Isolantite Mfg. Corp.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Penn Fibre & Specialty Co., Inc.
Rubbercraft Corp. of California
St. Marys Carbon Co.
Schlegel Mfg. Co.
Seaman Products
D. M. Steward Mfg. Co.
Synthane Corp.
H. I. Thompson Fiber Glass Co.
U. S. Hammered Piston Ring Co., Inc.
Zophar Mills Inc.

Metal-To-Glass

Auburn Spark Plug Co., Inc.
Barium & Chemicals, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Biwax Corp.
Carroll Pressed Metal, Inc.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
L. L. Constantin & Co.
Corning Glass Works
Demornay-Bonardi
Edgerton, Germeshausen & Grier, Inc.
Electrical Industries, Div.-Philips Electronics, Inc.
Fusite Corp.
Garde Mfg. Co.
Geisler Labs.
Gilmore Industries Inc.
Marblette Corp., The
McCormick Selph Associates
Micro-Wire Tungsten & Molybdenum Products
Pacific Universal Products Corp.
Penn Fibre & Specialty Co., Inc.
Philadelphia Scientific Glass Co.
Schlegel Mfg. Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Sylvania Electric Products Inc., Parts Div.
U. S. Hammered Piston Ring Co., Inc.
Wave Particle Corp.
***WESTINGHOUSE ELECTRIC CORP.**
X-Pando Corp.

Missile

Advanced Products Co., The
***AMERICAN MACHINE & FOUNDRY CO.**
Automatic & Precision Mfg. Co.
Bendix Products Div., Bendix Aviation Corp.
Chicago-Allis Mfg. Corp.
Coaxial Connector Co., Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Emerson Plastics Corp.
Fluorocarbon Co. Inc., The
Green, Tweed & Co.
Joclin Mfg. Co.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Penn Fibre & Specialty Co., Inc.
Progressive Research & Development Co., Inc.
Smith-Morris Corp.
Telectro Industries Corp.
U. S. Hammered Piston Ring Co., Inc.

Oil

Advanced Products Co., The
Anchor Packing Co., The
Bios Labs., Inc.
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
Dumont Aviation Associates
Fluorocarbon Co. Inc., The
Green, Tweed & Co.
Hammett Electric Co.
Joclin Mfg. Co.
Kasar Mfg. & Distributing Co., Inc.
Walter Lee Chemical Corp.
Magnetic Seal Corp.
Progressive Research & Development Co., Inc.
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
Simplex Piston Ring Mfg. Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.
Victor Mfg. & Gasket Co.

Pipe Joint

Advanced Products Co., The
Barium & Chemicals, Inc.
Bios Labs., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crane Packing Co.
Eco Engrg. Co.
Fluorocarbon Co. Inc., The
Green, Tweed & Co.
Joclin Mfg. Co.
Johns-Mansville Dutch Brand Div.
Walter Lee Chemical Corp.
Linear, Inc.
Parker-Hannifin Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
X-Pando Corp.

Pump

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crane Packing Co.
Eco Engrg. Co.
Fluorocarbon Co. Inc., The
Green, Tweed & Co.
Joclin Mfg. Co.
Kasar Mfg. & Distributing Co., Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Ohio Carbon Co., The
St. Marys Carbon Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.

Shaft

Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crane Packing Co.
Flexonics Corp
Graphite Metallizing Corp.
Green, Tweed & Co.
B. H. Hadley, Inc.
Joclin Mfg. Co.
Kasar Mfg. & Distributing Co., Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Neosil Products Co.
Ohio Carbon Co., The
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Progressive Research & Development Co., Inc.
St. Marys Carbon Co.
Simplex Piston Ring Mfg. Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
U. S. Hammered Piston Ring Co., Inc.
Victor Mfg. & Gasket Co.

SELENIUM

Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Chase Brass & Copper Co., Inc.
Green Rectifier Co.
Hammett Electric Co.
Winder Aircraft Corp. of Fla.

SEPARATION DEVICES

Aircraft Armaments, Inc.
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**

Mechanical Div.-General Mills, Inc.
Propellex Chemical Corp.
Raymond Engrg. Laboratory, Inc.
Republic Aviation Corp., Guided Missiles Div.
Stanley Aviation Corp.
Talco Engrg. Co., The
Thieblot Aviation Co., Div.-Vitro Corp. of America
Wickfield, Inc.
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Winder Aircraft Corp. of Fla.

SHEET METAL PARTS

ACF Industries, Inc., Advanced Products Div.
Aerodex, Inc.
Aircraft Mechanics, Inc.
Altamil Corp.
Aluminum Co. of America
American Brass Co., The
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Arnolt Corp.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Beaton & Corbin Mfg. Co., The
Butler Mfg. Co.
Chemical Contour Corp.
Conco Engrg. Works
***COOPER DEVELOPMENT CORP.**
Cromer Mfg. & Engrg., Inc.
Dayton Mfg. Co., Inc.
J. P. DeVine Mfg. Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Eljay Corp.
Essex Mfg. Co., Inc.
Falstrom Co.
Flexonics Corp.
Gasket Packing & Specialty Co., Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Hart Metal Products Corp.
Ludwig Honold Mfg. Co.
Houston Fearless Corp.
Hupp Aviation Co.
Industrial Engravers Inc.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
***KAHN & CO., INC.**
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kerns Mfg. Corp.
Kling Metal Spinning & Stamping Co.
***LAMINATED SHIM CO.**
La Pointe Industries Inc.
***LAVELLE AIRCRAFT CORP.**
Longren Aircraft Co., Inc.
Luria Engrg. Co.
***LYCOMING DIV., AVCO MFG. CORP.**
R. C. Mahon Co., The
Henry & Miller Industries, Inc.
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
Ozone Metal Products Corp.
Parish Pressed Steel, Div.-Dana Corp.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Peterson & Neville Inc.
Philco Corp., Government & Industrial Divs.
***PHOENIX PRODUCTS CO.**
Portland Copper & Tank Works Inc.
Republic Aviation Corp., Guided Missiles Div.
Revere Copper & Brass Inc.
Rohr Aircraft Corp.
Roll Formed Products Co.
Rowe Industries
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Schaffer Air Industries, Inc.
Shaw Metal Products Corp.
T. W. & C. B. Sheridan Co.
Smith-Morris Corp.
Solar Aircraft Co.
Specialties Mfg. Co., Inc.
Spincraft, Inc.
Standard Armament Inc.
Stanley Aviation Corp.
Superior Spinning & Stamping Co.
Tensor Electric Development Co., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
Transue & Williams Steel Forging Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Mfg. Co., The
Universal Machine Co., Inc.
Universal Metal Products Inc.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss-Wright Corp.

SHEETS, MOLYBDENUM

Eisler Engrg. Co., Inc.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
Hart Metal Products Corp.
Modglin Co. Inc.

SHIELDING

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American Brass Co., American Metal Hose Div.
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Zippertubing Co., The

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Glass R-F

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Hastings Plastics Inc.
Hupp Aviation Co.
National Research Corp.
Royal Industries, Inc.
Swedlow Plastics Co.
Zippertubing Co., The
Zirconium Corp. of America

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Bar-Ray Products, Inc.
Belmont Smelting & Refining Works, Inc.
Division Lead Co.
Gasket, Packing & Specialty Co. Inc.
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Hallett Mfg. Co.
Marblette Corp., The
Zippertubing Co., The

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Division Lead Co.
G. W. Galloway Co.
Gasket, Packing & Specialty Co. Inc.
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Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Zippertubing Co., The

Magnetic

Arnold Engrg. Co., The
Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Nuclear Corp. of America, Inc.
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Radiation

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Bar-Ray Products, Inc.
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Garrett Corp., The, Air Cruisers Div.
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Marblette Corp., The
McMillan Industrial Corp.
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Shielding Inc.
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Zippertubing Co., The

Radiation, Nuclear

Allied Plastics Supply Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
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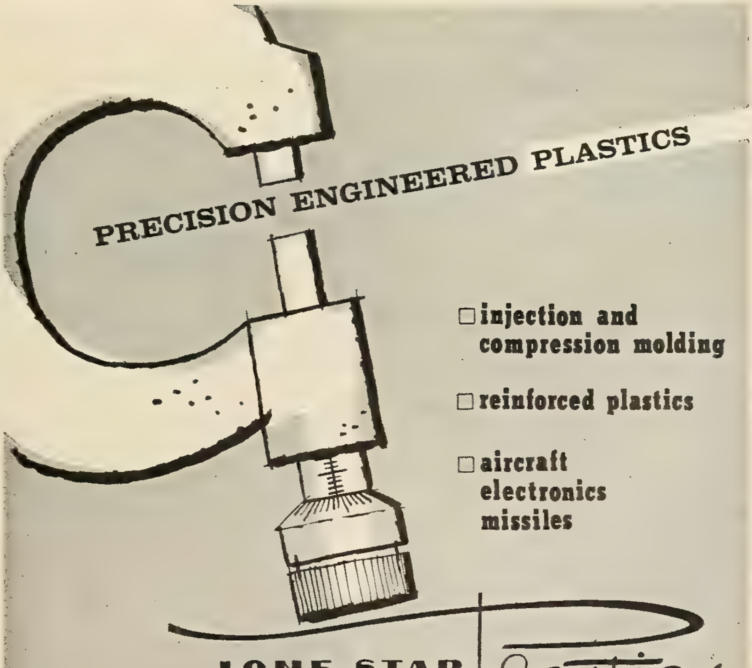
Bar-Ray Products, Inc.
Corning Glass Works



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Co-Operative Industries, Inc.
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Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
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Winder Aircraft Corp. of Fla.
Zippertubing Co., The

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Zippertubing Co., The

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Connecticut Hard Rubber Co., The
Continental Rubber Works
General Gasket Inc.
Magnetic Shield Div.-Perfection Mica Co.
Roberts Toledo Rubber Co., The
Rogers Corp.
Western Felt Works

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Allied Plastics Supply Corp.
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Magnetic Shield Div.-Perfection Mica Co.
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Continental Diamond Fibre Corp., Sub.-The Budd Co.
Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Shielding Inc.

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Belden Mfg. Co.
Birnbach Radio Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Co-Operative Industries, Inc.
Flexonics Corp.
General Cable Corp.
Hallett Mfg. Co.
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Bridgwater Machine Co.
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B. F. Goodrich Aviation Products
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K. W. Johnson & Co., Inc.
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Roberts Toledo Rubber Co., The
Robinson Aviation, Inc.
Rubbercraft Corp. of California
Telectro Industries Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United Mfg. Co., The
United-Carr Fastener Corp.

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Delta Chemical Works, Inc.
Eagle-Picher Co., The
Foote Mineral Co.
Green Rectifier Co.

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Chicago-Allis Mfg. Corp.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp. Sub.—The Budd Co.
Continental Rubber Works
Delta Chemical Works, Inc.
Eagle-Picher Co., The
Emerson Plastics Corp.
Garrett Corp., The, Air Cruisers Div.
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B. F. Goodrich Aviation Products
Hewitt-Robins, Inc.
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Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
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Rubbercraft Corp. of California
Silicone Products Dept., General Electric Co.
Silicones Div.—Union Carbide Corp.
Varflex Corp.

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Bram Metallurgical & Chemical Co.
Dalweld Co. Inc.
Delta Chemical Works, Inc.
Division Lead Co.
Eastern Smelting & Refining Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Goldsmith Brothers Smelting & Refining Co.
Handy & Harman
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Varflex Corp.
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William Brand & Co., Inc.
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Enflo Corp.
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Borden Chemical Co., The, Div.—The Borden Co., Resinite Dept.
William Brand & Co., Inc.
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General Cement Mfg. Co., Div.—Textron Inc.
Orange Roller Bearing Co., Inc.
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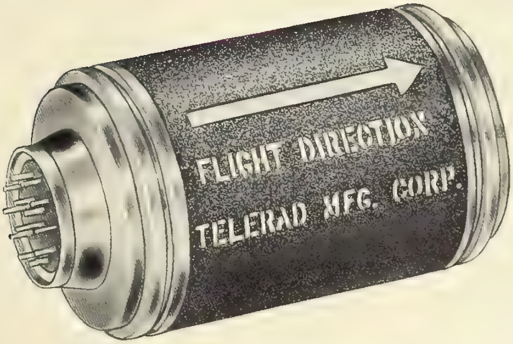
NEWS: FOR MISSILE DESIGNERS AND MANUFACTURERS

NEW ACCELERATION ACTIVATED SWITCHES FOR IN-FLIGHT MISSILE CONTROL



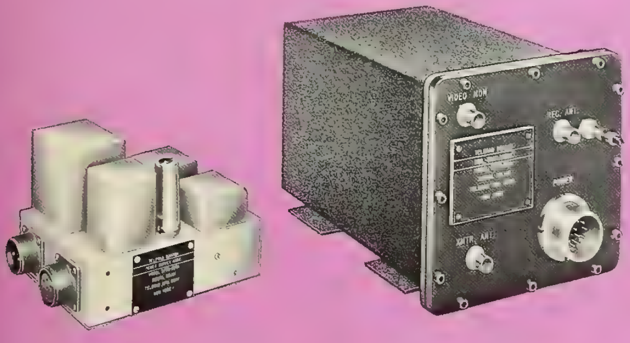
This miniature acceleration operated switch is designed for missile applications requiring positive switch functions at first motion, during, or after boost. Versatile locking arrangement permits cycling or recycling of switch during various phases of flight (requires 30 watt signal). It is conservatively rated and is designed for expendable one-time use.

The switch may be pre-set to activate at any first-motion level between 5 and 20 G's longitudinal acceleration. Average transverse accelerations can be tolerated during operation. Design permits locking or unlocking at accelerations 10 G's in excess of pre-set level. Switch functions within 50 milliseconds after reaching operational acceleration.

ADVANTAGES:

- Small size, uses standard BuOrd #18 synchro mount.
- Light weight, approximately 12 ounces (depending on model).
- Rugged, Meets military specifications for aircraft and missile use.
- Standard switch arrangements: 5 SPST make, break, or pulse. Custom arrangements available with minimum delay.
- Sealed construction permits use in explosive atmospheres.
- Standard temperature range —65°F to +250°F. Extended range to +500°F available with modified ratings.

NEW HIGH-SENSITIVITY S-BAND BEACONS



New superheterodyne S-Band Beacons for guided missile and drone-control applications. These receivers feature light weight, small size, excellent reliability, ruggedized construction.

PERFORMANCE DATA

Receiver-Transmitter

- **Over-all triggering sensitivity:** —65 DBM
- **Receiver frequency:** 2700-2900 mc
- **Receiver frequency stability:** ±2 megacycles per second
- **Image rejection:** 50 db minimum
- **Peak transmitter power output:** 100 watts minimum
- **Transmitter pulse width:** 0.75 microseconds
- **Transmitter repetition rate:** 200-1,000 pps
- **Transmitter stability:** ±2 megacycles per second
- **Transmitter frequency range:** 2850 to 2950 mc
- **Size:** 9" x 5¼" x 5"
- **Weight:** 8 lbs.

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- **Input Voltage:** 115 volts at 400 cycles
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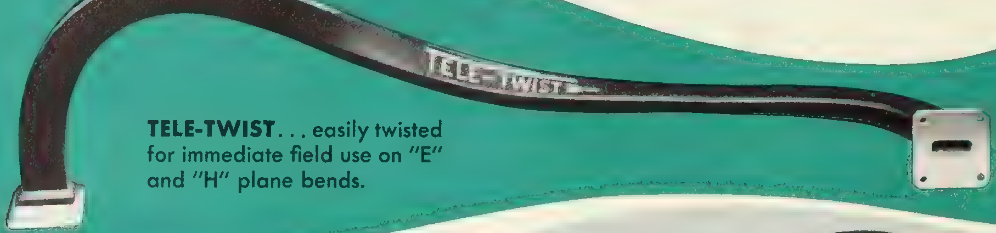

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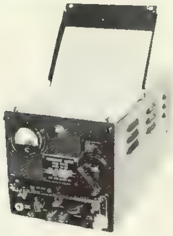

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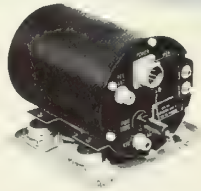

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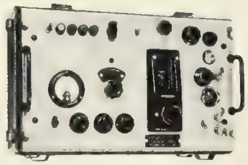

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General Sound Control, Inc.
Hamilton Watch Co., Military Products Div.
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J. E. Menaugh Co.
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Hunter Spring Co.
Leetronics, Inc.
Mid-West Spring Mfg. Co.
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Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Reliable Spring & Wire Forms Co., The
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Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
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Republic Aviation Corp., Guided Missiles Div.
*RHEEM MFG. CO., AIRCRAFT DIV.
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Thieblot Aviation Co., Div.-Vitro Corp. of America
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Hamilton Watch Co., Military Products Div.
Hunter Spring Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kling Metal Spinning & Stamping Co.
Leach & Garner Co., Industrial Div.
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Peerless Products Industries
Progressive Research & Development Co., Inc.
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Sylvania Electric Products Inc., Parts Div.
Techniques, Inc.
Twix Mfg. Co., Inc.
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Winder Aircraft Corp. of Fla.

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Carpenter Steel Co., The
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National Forge & Ordnance Co.
Republic Steel Corp.
Thompson Products, Inc.
United States Steel Corp.
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*WESTINGHOUSE ELECTRIC CORP.

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National Research Corp.
National-Standard Co.
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Standard Metals Corp.
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Republic Steel Corp.
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Thompson Products, Inc.
Tube Distributors Co., Inc.
United States Steel Corp.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America
Wallingford Steel Co.

STRONTIUM

Barium & Chemicals, Inc.
Bram Metallurgical & Chemical Co.
Foote Mineral Co.

SUPERSONIC EQUIPMENT

CDC Control Services, Inc.
Marquardt Aircraft Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Republic Aviation Corp., Guided Missiles Div.
Skiatron Electronics & Television Corp.
Stanley Aviation Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Ultradyne, Inc.
*WESTINGHOUSE ELECTRIC CORP.

SUPPORTS, TUBE

*AMERICAN MACHINE & FOUNDRY CO.
American Steel Foundries, Hammond Div.
Beaton & Corbin Mfg. Co., The
Bridgwater Machine Co.
Champion Airquipment Inc.
*DIVERSEY ENGRG. CO.
Gasket, Packing & Specialty Co., Inc.
Hahn & Clay
Houston Fearless Corp.
Walter J. Hyatt Co., The
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kellett Aircraft Corp.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Roll Formed Products Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The

TAILPIPES, JET ENGINE

ACF Industries, Inc., Advanced Products Div.
Aircraft Mechanics, Inc.
American Welding & Mfg. Co., The
Basic Tool Industries, Inc.
Bridgwater Machine Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
La Pointe Industries Inc.
*LAVELLE AIRCRAFT CORP.
*LYCOMING DIV., AVCO MFG. CORP.
Portland Copper & Tank Works Inc.
Quick Charge Corp.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Turbo Products, Inc.
Twin Coach Co.-Aircraft Div.
Warren Mfg. Div., Warren Brothers Roads Co.
Westholt Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

TANKS

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Aluminum Co. of America
American Welding & Mfg. Co., The
Basic Tool Industries, Inc.
California Aircraft Products
Champion Co., The

. . . missile frame

Cromer Mfg. & Engrg., Inc.
J. P. DeVine Mfg. Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hahn & Clay
Hart Metal Products Corp.
Houston Fearless Corp.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
R. C. Mahon Co., The
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Mfg. Co., The
United States Chemical Milling Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Wells Industries Corp.
Westholt Mfg. Co.
Winder Aircraft Corp. of Fla.

Auxiliary

ACF Industries, Inc., Advanced Products Div.
Aluminum Co. of America
American Car & Foundry Div., ACF Industries, Inc.
Associated Co., Inc.
Basic Tool Industries, Inc.
Champion Co., The
Cromer Mfg. & Engrg., Inc.
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
Hahn & Clay
Hart Metal Products Corp.
Houston Fearless Corp.
Hupp Aviation Co.
Hussmann Aircraft Div.
Javelin Aircraft Co. Inc.
Joclin Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Modglin Co. Inc.
Parish Pressed Steel, Div.-Dana Corp.
Patterson Foundry & Machine Co., The
Philips & Davies Inc.
Rohr Aircraft Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Shaw Metal Products Corp.
Smith-Morris Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Titanium Metals Corp. of America
Twin Coach Co.-Aircraft Div.
***UNITED AIRCRAFT PRODUCTS, INC.**
United States Chemical Milling Corp.
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Wells Industries Corp.
Westholt Mfg. Co.
Winder Aircraft Corp. of Fla.

Fuel

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Aluminum Co. of America
American Car & Foundry Div., ACF Industries, Inc.
Aro Equipment Corp., The
Associated Co., Inc.
Basic Tool Industries, Inc.
Champion Co., The
Cromer Mfg. & Engrg., Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
B. F. Goodrich Aviation Products
Goodyear Aircraft Corp.
Hahn & Clay
Hart Metal Products Corp.
Hupp Aviation Co.
Hussmann Aircraft Div.
Javelin Aircraft Co. Inc.
Joclin Mfg. Co.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
Longren Aircraft Co., Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
Parish Pressed Steel, Div.-Dana Corp.
Philips & Davies Inc.
Pressed Steel Tank Co.
Reaction Motors, Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Shaw Metal Products Corp.
Smith-Morris Corp.
Solar Aircraft Co.
Spincraft, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United States Chemical Milling Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Wells Industries Corp.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss-Wright Corp.

Liquid Nitrogen

ACF Industries, Inc., Advanced Products Div.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Aro Equipment Corp., The
Champion Co., The
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
Hahn & Clay
Javelin Aircraft Co. Inc.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
Philips & Davies Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Ronan & Kunzl, Inc.
***RYAN INDUSTRIES**
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wells Industries Corp.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Liquid Oxygen

ACF Industries, Inc., Advanced Products Div.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Aro Equipment Corp., The
Champion Co., The
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hahn & Clay
Javelin Aircraft Co. Inc.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
Patterson Foundry & Machine Co., The
Philips & Davies Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
Reaction Motors, Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ronan & Kunzl, Inc.
***RYAN INDUSTRIES**
Solar Aircraft Co.
Spincraft, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wells Industries Corp.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Liquified Gas Storage

ACF Industries, Inc., Advanced Products Div.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
American Car & Foundry Div., ACF Industries, Inc.
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
Hahn & Clay
Javelin Aircraft Co. Inc.
Herrick L. Johnston, Inc.
Kelsey-Hayes Co.
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
Philips & Davies Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ronan & Kunzl, Inc.
***RYAN INDUSTRIES**
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Weatherhead Co., The
Wells Industries Corp.
Westholt Mfg. Co.

Oil

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Buffalo Metal Container Corp.
Collins Engrg. Corp.
Cromer Mfg. & Engrg., Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
B. F. Goodrich Aviation Products
Houston Fearless Corp.
Hupp Aviation Co.
Javelin Aircraft Co. Inc.
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
Patterson Foundry & Machine Co., The
Philips & Davies Inc.
***REGENT JACK MFG. CO., INC.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
Solar Aircraft Co.
Spincraft, Inc.
Twin Coach Co.-Aircraft Div.
Weber Aircraft Corp.
Wells Industries Corp.

Self-Sealing

ACF Industries, Inc., Advanced Products Div.
Eaton Mfg. Co., Inc., Fredric Flader Div.
B. F. Goodrich Aviation Products
Javelin Aircraft Co. Inc.
Modglin Co. Inc.
Philips & Davies Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
***UNITED AIRCRAFT PRODUCTS, INC.**
***WASHINGTON ALUMINUM CO., INC.**
Wells Industries Corp.

Transportation and Storage

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Aluminum Co. of America
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Applied Design Co.
Buffalo Metal Container Corp.
Champion Co., The
Conco Engrg. Works
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Foreman Mfg. Co.
B. F. Goodrich Aviation Products
Goodyear Aircraft Corp.
Javelin Aircraft Co., Inc.
Longren Aircraft Co., Inc.
Modglin Co. Inc.
Opelika Welding, Machine, & Supply Inc.
Philips & Davies Inc.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
***REGENT JACK MFG. CO., INC.**
***RHEEM MFG. AIRCRAFT DIV.**
Royal Industries, Inc.
***RYAN INDUSTRIES**
Solar Aircraft Co.
Thompson Products, Inc.
***TRAILMOBILE INC.**
Warren Mfg. Div., Warren Brothers Roads Co.
Weber Aircraft Corp.
Wells Industries Corp.

TANTALUM

Accurate Specialties Co. Inc.
Alpha Metals, Inc.
American Silver Co.
Belmont Smelting & Refining Works, Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Fansteel Metallurgical Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Javelin Aircraft Co. Inc.
Johnston & Funk Titanium Corp.
Kennametal Inc.
P. R. Mallory & Co. Inc.
National Research Corp.

TAPES

Allied Plastics Supply Corp.
Anchor Packing Co., The
Auburn Mfg. Co., The
Chart-Pak, Inc.
Duracote Corp.
Dwyer Engrg. Co., Inc.
Enflo Corp..
Gatke Corp.
Joclin Mfg. Co.
Raybestos-Manhattan, Inc.
Schlegel Mfg. Co.
Silicones Div.-Union Carbide Corp.

Asbestos

Allied Plastics Supply Corp.
Anchor Packing Co., The
Atlas Asbestos Co.
Auburn Mfg. Co., The
Gatke Corp.
General Cable Corp.
Green, Tweed & Co.
Raybestos-Manhattan, Inc.
Union Asbestos & Rubber Co.

Coated and Impregnated

Allied Plastics Supply Corp.
American Cord & Webbing Co., Inc.
Arno Adhesive Tapes, Inc.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Duracote Corp.
General Plastics Corp. of New Jersey
Green, Tweed & Co.
Johns-Mansville Dutch Brand Div.
Narmco Resins & Coatings Co.
Silicones Div.-Union Carbide Corp.
Union Asbestos & Rubber Co.
Warren Wire Co.

Electrical Insulation

Allied Plastics Supply Corp.
Anchor Packing Co., The
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.- The Borden Co.
W. H. Brady Co.
William Brand & Co., Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crane Packing Co.
Dixon Corp.
Enflo Corp.
Joclin Mfg. Co.
Johns-Mansville Dutch Brand Div.
New England Tape Co. Inc.
Okonite Co., The
Silicones Div.-Union Carbide Corp.
Surprenant Mfg. Co.
H. I. Thompson Fiber Glass Co.
Warren Wire Co.
***WESTINGHOUSE ELECTRIC CORP.**

Fabric

Allied Plastics Supply Corp.
American Cord & Webbing Co., Inc.
Arno Adhesive Tapes, Inc.
Atlas Asbestos Co.
W. H. Brady Co.
William Brand & Co., Inc.
C. R. Daniels, Inc.
Duracote Corp.
Hastings Plastics Inc.
Johns-Mansville Dutch Brand Div.
Reeves Brothers Inc., Vulcan Rubber Products Div.
Schlegel Mfg. Co.
A. T. Stevens Co.
Warren Wire Co.

Friction

Allied Plastics Supply Corp.
Anchor Packing Co., The
Continental Rubber Works
Joclin Mfg. Co.
Johns-Mansville Dutch Brand Div.
Okonite Co., The

Heat Resistant

Allied Plastics Supply Corp.
American Cord & Webbing Co., Inc.
Anchor Packing Co., The
Arno Adhesive Tapes, Inc.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
General Cable Corp.
General Plastics Corp. of New Jersey
Joclin Mfg. Co.
Johns-Mansville Dutch Brand Div.
Silicones Div.-Union Carbide Corp.
Union Asbestos & Rubber Co.
Warren Wire Co.

Plastic

Allied Plastics Supply Corp.
American Cord & Webbing Co., Inc.
Anchor Packing Co., The
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
W. H. Brady Co.
William Brand & Co., Inc.
Chart-Pak, Inc.
Continental Rubber Works
Crane Packing Co.
Dixon Corp.
Duracote Corp.
Dwyer Engrg. Co., Inc.
Enflo Corp.
Flexrock Co.
Hastings Plastics Inc.
Joclin Mfg. Co.
Johns-Mansville Dutch Brand Div.
New England Tape Co. Inc.
Okonite Co., The
Rex Corp., The
Roovers-Lotson Corp.
Sparta Mfg. Co.
Surprenant Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Zippertubing Co., The

Pressure Sensitive

Allied Plastics Supply Corp.
Armstrong Cork Co.
Arno Adhesive Tapes, Inc.
W. H. Brady Co.
William Brand & Co., Inc.
Chart-Pak, Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dilectrix Corp.
Duracote Corp.
Enflo Corp.
Flexrock Co.
General Plastics Corp. of New Jersey
Joclin Mfg. Co.
Johns-Mansville Dutch Brand Div.
Master Tape Printers
Naz-Dar Co.
Roovers-Lotson Corp.
Silicones Div.-Union Carbide Corp.
Sohl Co., The
Topflight Corp.
Warren Wire Co.
Westline Products Div., Western Lithograph Co.

Rubber, Natural and Synthetic

Allied Plastics Supply Corp.
Armstrong Cork Co.
Auburn Mfg. Co., The
Connecticut Hard Rubber Co., The
Continental Rubber Works
Duracote Corp.
Johns-Mansville Dutch Brand Div.
Okonite Co., The
Raybestos-Manhattan, Inc.
Rubbercraft Corp. of California
Silicones Div.-Union Carbide Corp.

TEFLON

Allied Plastics Supply Corp.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Alpha Wire Corp.
American Felt Co.
Anchor Packing Co., The
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
N. S. Baer Co.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
Bram Metallurgical & Chemical Co.
Chicago-Allis Mfg. Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crane Packing Co.
Crystal-X Corp.
Darcoid Co., Inc., The
Delta Chemical Works, Inc.
Dilectrix Corp.
Dixon Corp.
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
Flexrock Co.
Fluorocarbon Co. Inc., The
Franklin Fibre-Lamitex Corp.
Garrett Corp., The, Air Cruisers Div.
Gasket, Packing & Specialty Co. Inc.
General Gasket Inc.
General Plastics Corp. of New Jersey
Green, Tweed & Co.
Halogen Insulator & Seal Corp.
Illumitronic Engrg. Co.
Joclin Mfg. Co.
Walter Lee Chemical Corp.
Thomas J. Long, Inc.
J. E. Menaugh Co.
Mica Fabricating Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
Rex Corp., The
Rogers Corp.
St. Regis Paper Co.
Schlegel Mfg. Co.
Sparta Mfg. Co.
A. T. Stevens Co.
Surprenant Mfg. Co.
Topper Mfg. Co., Inc.
United Supply Co.
Vlchek Tool Co., The
Warren Wire Co.
Western International Co.

TIN & ALLOYS

Accurate Specialties Co. Inc.
Alpha Metals, Inc.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bow Solder Products Co., Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Division Lead Co.
Johnson Mfg. Co., Inc.
Warren Wire Co.

TINNING, HOT DIPPED

Alpha Metals, Inc.
Dwyer Engrg. Co., Inc.
Hart Metal Products Corp.

TITANIUM

American Car & Foundry Div., ACF Industries, Inc.
American Silver Co.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Eisler Engrg. Co., Inc.
Firth Sterling Inc.
Foote Mineral Co.
Hart Metal Products Corp.
Johnston & Funk Titanium Corp.
P. R. Mallory & Co. Inc.
***MALLORY-SHARON METALS CORP.**
Metals & Controls Corp.
Thiebolt Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Titanium Metals Corp. of America
Twix Mfg. Co., Inc.

TRIM TABS

Aircraft Mechanics, Inc.
All American Aircraft Products, Inc.
Hussmann Aircraft Div.
Javelin Aircraft Co. Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Longren Aircraft Co., Inc.
Modglin Co. Inc.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Sohl Co., The
Talley Corp., The
Westholt Mfg. Co.
Woolf Aircraft Products, Inc.

TUBING

Allied Plastics Supply Corp.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., American Metal Hose Div.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Babcock & Wilcox Co. Tubular Products Div.
Bridgeport Brass Co.
California Aircraft Products
Carpenter Steel Co., The
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Empire State Aluminum Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Hahn & Clay
Haynes Stellite Co., Div.-Union Carbide Corp.
Thomas J. Long, Inc.
Metals & Controls Corp.
National Copper & Smelting Co.
Precision Tube Co., Inc.

Raybestos-Manhattan, Inc.
[illegible] Corp.
Revere Copper & Brass Inc.
Rubbercraft Corp. of California
Ryan Aeronautical Co.
St. Regis Paper Co.
Superior Tube Co.
Surprenant Mfg. Co.
Synthane Corp.
Tube Reducing Corp.
Wallingford Steel Co.
***WASHINGTON ALUMINUM CO., INC.**
***R. D. WERNER CO., INC.**
Western International Co.
Zippertubing Co., The

Aluminum

All Boro Metal Products Co., Inc.
Aluminum Co. of America
American Brass Co., The
***AMERICAN TUBE BENDING CO., INC.**
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Bridgeport Brass Co.
Delta Chemical Works, Inc.
G. M. Dykes Iron Works, Inc.
Empire State Aluminum Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
Hahn & Clay
Hart Metal Products Corp.
Harvey Aluminum
Kaiser Aluminum & Chemical Sales, Inc.
La Pointe Industries Inc.
R. I. Metpro, Inc.
Precision Tube Co., Inc.
Revere Copper & Brass Inc.
Rohr Aircraft Corp.
Roll Formed Products Co.
Joseph T. Ryerson & Son, Inc.
South River Metal Products Co., Inc.
Standard Metals Corp.
***WASHINGTON ALUMINUM CO., INC.**
***R. D. WERNER CO., INC.**
Zippertubing Co., The

Asbestos

Allied Plastics Supply Corp.
Atlas Asbestos Co.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Darcoid Co., Inc., The
Delta Chemical Works, Inc.
General Plastics Corp. of New Jersey
R. I. Metpro, Inc.
Paramount Paper Tube Corp.
Raybestos-Manhattan, Inc.

Brass or Copper

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., The
***AMERICAN TUBE BENDING CO., INC.**
Ampco Metal, Inc.
Anchor Coupling Co. Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
Delta Chemical Works, Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
Leach & Garner Co., Industrial Div.
R. I. Metpro, Inc.
National Copper & Smelting Co.
Precision Tube Co., Inc.
Revere Copper & Brass Inc.
Roll Formed Products Co.
Springfield Brass Co.
Standard Metals Corp.

Capillary

Allied Plastics Supply Corp.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., The
J. Bishop & Co., Platinum Works
Bridgeport Brass Co.
Delta Chemical Works, Inc.
Fromson Orban Co., Inc.
New England Electrical Works, Inc.
Precision Tube Co., Inc.
Revere Copper & Brass Inc.
Service Steel
Superior Tube Co.

Ceramic

American Lava Corp.
Auburn Spark Plug Co., Inc.
Corning Glass Works
Delta Chemical Works, Inc.
Diamonite Products Mfg. Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Erie Resistor Corp.
Isolantite Mfg. Corp.
Lapp Insulator Co., Inc., Radio Specialties Div.
Maryland Lava Co.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
Norton Co.
Resdel Corp.
Saxonburg Ceramics
D. M. Steward Mfg. Co.
Thermo Materials, Inc.
Western Gold & Platinum
Zirconium Corp. of America

Fibre

Allied Plastics Supply Corp.
Alpha Wire Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Continental Diamond & Fibre Corp., Sub.-The Budd Co.
Emerson Plastics Corp.
Engineered Plastics, Inc.
Franklin Fibre-Lamitex Corp.
General Cement Mfg. Co., Div.-Textron Inc.
Thomas J. Long, Inc.
Magnetic Shield Div.-Perfection Mica Co.
Mica Fabricating Co.
Paramount Paper Tube Corp.
Rogers Corp.
Spaulding Fibre Co., Inc.

Finned

Griscom-Russell Co., The
Revere Copper & Brass Inc.
Rohr Aircraft Corp.

Flexible Metal

Allied Plastics Supply Corp.
American Brass Co., The
American Brass Co., American Metal Hose Div.
Arrowhead Products Div.—Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Co-Operative Industries, Inc.
D K Mfg. Co.
Delta Chemical Works, Inc.
Flexible Metal Hose Mfg. Co.
General Cable Corp.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
Rodney Metals Inc.
Servicair Co.
Skytronics
Stainless Steel Products, Inc.
Titeflex, Inc.

Fused Quartz

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Kemlite Laboratories, Inc.
Thermal American Fused Quartz Co., Inc.

Glass Fibre Insulation

Allied Plastics Supply Corp.
Alpha Wire Corp.
American Super Temperature Wires Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
B. & C. Insulation Products, Inc.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Duracote Corp.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Hitemp Wires, Inc.
Lamtex Industries, Inc.
Mica Fabricating Co.
Silicone Insulation, Inc.
Synthane Corp.
H. I. Thompson Fibre Glass Co.
Varflex Corp.
Warren Wire Co.
Zippertubing Co., The

Glass Precision

Allied Plastics Supply Corp.
Semon Bache & Co.
***BAUSCH & LOMB OPTICAL CO.**
Corning Glass Works
Delta Chemical Works, Inc.
Pacific Universal Products Corp.

Metal and Alloy

All Boro Metal Products Co., Inc.
Aluminum Co. of America
***AMERICAN TUBE BENDING CO., INC.**
Ampco Metal, Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Babcock & Wilcox Co. Tubular Products Div.
J. Bishop & Co. Platium Works
Bram Metallurgical & Chemical Co.
California Aircraft Products
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Dow Chemical Co., The
Engelhard Industries Inc., D. E. Makepeace Div.
Hahn & Clay
Haynes Stellite Co., Div.-Union Carbide Corp.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
R. I. Metpro, Inc.
Ohio Seamless Tube Div.-Copperweld Steel Co.
Precision Tube Co., Inc.
Resistoflex Corp.
Revere Copper & Brass Inc.
Rohr Aircraft Corp.
Roll Formed Products Co.
Ryan Aeronautical Co.
Service Steel
Standard Metals Corp.
Superior Tube Co.
Timken Roller Bearing Co., The
Titeflex, Inc.
Tube Distributors Co., Inc.
Tube Methods Inc.
Tube Reducing Corp.
Wallingford Steel Co.

Metal Hose, Flexible

Allied Plastics Supply Corp.
American Brass Co., The
American Brass Co., American Metal Hose Div.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Co-Operative Industries, Inc.
D K Mfg. Co.
Federal Metal Hose Corp.
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Hallett Mfg. Co.
Rodney Metals Inc.
Servicair Co.
Stainless Steel Products, Inc.
Titeflex, Inc.
Zippertubing Co., The

Mica

Allied Plastics Supply Corp.
Auburn Spark Plug Co., Inc.
Bram Metallurgical & Chemical Co.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Delta Chemical Works, Inc.
Magnetic Shield Div.-Perfection Mica Co.
Mica Fabricating Co.

Molybdenum

J. Bishop & Co. Platium Works
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Delta Chemical Works
Eisler Engrg. Co., Inc.
Fansteel Metallurgical Corp.
Micro-Wire Tungsten & Molybdenum Products
Ryan Aeronautical Co.
Tube Distributors Co., Inc.

Monel

***AMERICAN TUBE BENDING CO., INC.**
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Hahn & Clay
Precision Tube Co., Inc.
Ryan Aeronautical Co.
Superior Tube Co.
Tube Distributors Co., Inc.
Tube Reducing Corp.

Nickel

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
***AMERICAN TUBE BENDING CO., INC.**
J. Bishop & Co., Platinum Works
Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Hahn & Clay
R. I. Metpro, Inc.
Precision Tube Co., Inc.
Superior Tube Co.
Tube Distributors Co., Inc.
Tube Reducing Corp.

Paper

Allied Plastics Supply Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Paramount Paper Tube Corp.
Penn Fibre & Specialty Co., Inc.
Rogers Corp.

Phenolic

Allied Plastics Supply Corp.
Aristocrat Plastics, Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
N. S. Baer Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Eljay Corp.
Emerson Plastics Corp.

Engineered Plastics, Inc.
Fluorocarbon Co. Inc., The
Franklin Fibre-Lamitex Corp.
Illumitronic Engrg. Co.
Thomas J. Long, Inc.
Marblette Corp., The
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
St. Regis Paper Co.
Science House, Inc.
Spaulding Fibre Co., Inc.
Synthane Corp.
Waterbury Companies, Inc.
Western International Co.
Westlake Plastics, CrystalX Corp.

Plastic

Allied Plastics Supply Corp.
Alpha Wire Corp.
Amercoat Corp.
American Agile Corp.
American Brass Co., American Metal Hose Div.
American Super Temperature Wires Inc.
Aristocrat Plastics, Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Birnbach Radio Co., Inc.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Chicago Gasket Co.
Columbia Rope Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crane Packing Co.
Crystal-X Corp.
Dixon Corp.
Eljay Corp.
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
Franklin Fibre-Lamitex Corp.
General Plastics Corp. of Indiana
B. F. Goodrich Aviation Products
Hastings Plastics Inc.
Hitemp Wires, Inc.
Illumitronic Engrg. Co.
Imperial Brass Mfg. Co., The
Jodee Plastics Co.
Lamtex Industries, Inc.
Walter Lee Chemical Corp.
Thomas J. Long, Inc.
New England Tape Co. Inc.
Raybestos-Manhattan, Inc.
Resdel Corp.
Resistoflex Corp.
Rex Corp., The
Joseph T. Ryerson & Son, Inc.
Science House, Inc.
Silicone Insulation, Inc.
M. L. Snyder & Son, Inc.
Sparta Mfg. Co.
Surprenant Mfg. Co.
Synthane Corp.
Titeflex, Inc.
Topper Mfg. Co., Inc.
United States Steel Corp.
Varflex Corp.
Waterbury Companies, Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Westlake Plastics, CrystalX Corp.
Westline Products Div., Western Lithograph Co.
Zippertubing Co., The

Precious Metal

Allied Research & Engrg. Div.-Allied Record Mfg. Co.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eastern Smelting & Refining Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Standard Metals Corp.
Tricon Mfg. Co.

Seamless

All Boro Metal Products Co., Inc.
American Brass Co., The
***AMERICAN TUBE BENDING CO., INC.**
Ampco Metal, Inc.
Anchor Coupling Co. Inc.
Babcock & Wilcox Co. Tubular Products Div.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
G. M. Dykes Iron Works, Inc.
Electric Steel Foundry Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Ohio Seamless Tube Div.-Copperweld Steel Co.
Precision Tube Co., Inc.
Revere Copper & Brass Inc.
Roll Formed Products Co.
Service Steel
Standard Metals Corp.
Superior Tube Co.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
Tube Methods Inc.
Tube Reducing Corp.
United States Steel Corp.
Varflex Corp.

Silver

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eastern Smelting & Refining Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Goldsmith Brothers Smelting & Refining Co.
Handy & Harman
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Republic Steel Corp.
Standard Metals Corp.
Tricon Mfg. Co.

Steel

Babcock & Wilcox Co. Tubular Products Div.
J. Bishop & Co. Platinum Works
California Aircraft Products
Crucible Steel Co. of America
Delta Chemical Works, Inc.
G. M. Dykes Iron Works, Inc.
Electric Steel Foundry Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
Hahn & Clay
Luria Engrg. Co.
R. I. Metpro, Inc.
Ohio Seamless Tube Div.-Copperweld Steel Co.
Precision Tube Co., Inc.
Republic Steel Corp.
Revere Copper & Brass Inc.
Rodney Metals Inc.
Ryan Aeronautical Co.
Joseph T. Ryerson & Son, Inc.
Service Steel
Superior Tube Co.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
Tube Reducing Corp.
United States Steel Corp.

Steel, Stainless

All Boro Metal Products Co., Inc.
***AMERICAN TUBE BENDING CO., INC.**
Babcock & Wilcox Co. Tubular Products Div.
J. Bishop & Co. Platium Works
Bram Metallurgical & Chemical Co.
California Aircraft Products
Carpenter Steel Co., The
Carpenter Steel Co., The, Alloy Tube Div.
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Electric Steel Foundry Co.
Englehard Industries Inc., D. E. Makepeace Div.
Firth Sterling Inc.
Flexonics Corp.
Fromson Orban Co., Inc.
Hahn & Clay
Hart Metal Products Corp.
Luria Engrg. Co.
R. I. Metpro, Inc.
Portland Copper & Tank Works, Inc.
Precision Tube Co., Inc.
Rodney Metals Inc.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Joseph T. Ryerson & Son, Inc.
Service Steel
Stainless Steel Products, Inc.
Superior Tube Co.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
Tube Methods Inc.
Tube Reducing Corp.
United States Steel Corp.
Wallingford Steel Co.

Tantalum

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Fansteel Metallurgical Corp.
Hart Metal Products Corp.
Metals & Controls Corp.

Titanium

Babcock & Wilcox Co. Tubular Products Div.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Carpenter Steel Co., The, Alloy Tube Div.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Firth Sterling Inc.
Flexonics Corp.
Hart Metal Products Corp.
Harvey Aluminum
Johnston & Funk Titanium Corp.
Metals & Controls Corp.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Superior Tube Co.
Titanium Metals Corp. of America
Tube Reducing Corp.
Wallingford Steel Co.

Tungsten

Bergen Carbide Co.
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Fansteel Metallurgical Corp.
Micro-Wire Tungsten & Molybdenum Products

Varnished Cambric Insulation

Allied Plastics Supply Corp.
Alpha Wire Corp.
B. & C. Insulation Products. Inc.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Varflex Corp.

Varnished or Lacquered

Allied Plastics Supply Corp.
Alpha Wire Corp.
B. & C. Insulation Products, Inc.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Paramount Paper Tube Corp.
St. Regis Paper Co.
Varflex Corp.

Woven or Knitted Wire

Alpha Wire Corp.
J. Bishop & Co., Platinum Works
Cambridge Wire Cloth Co., The
Naz-Dar Co.
Science House, Inc.

VARNISH

Krylon, Inc.
Naz-Dar Co.
Silicones Div.-Union Carbide Corp.
L. Sonneborn & Sons, Inc. Building Products Div.
United States Varnish Co.

VENTURI TUBES

Aero Research Instrument Co. Inc.
Allied Research & Engrg. Div.-Allied Record Mfg. Co.
Beaton & Corbin Mfg. Co., The
Commercial Shearing & Stamping Co.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Machine Engrg. Co. Inc.
National Airoil Burner Co.
Pressed Steel Tank Co.
Ryan Aeronautical Co.
***C. W. TORNGREN CO., INC.**

VESSELS

Acme Welding Div., The United Tool & Die Co.
***COOPER DEVELOPMENT CORP.**
J. P. Devine Mfg. Co.
***DIVERSEY ENGRG. CO.**
G. W. Galloway Co.
B. F. Goodrich Aviation Products
Hoke Inc.
Houston Fearless Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
R. C. Mahon & Co., The
Patterson Foundry & Machine Co., The
Philips & Davies Inc.
Portland Copper & Tank Works Inc.
Spincraft, Inc.
Titanium Metals Corp. of America
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

VIBRATION ABSORBERS

American Brass Co., American Metal Hose Div.
Barry Controls Inc.
Cleveland Pneumatic Tool Co., The, Div.
Cleveland Pneumatic Industries, Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Joe Davidson & Associates
Dow-Elco, Inc.
***FINN AERONAUTICAL DIV., T. R. FINN & CO., INC.**
Flock Process Co. Inc.
General Cable Corp.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Walter K. Jaros, Aircrafters
Walter Kidde & Co., Inc., Aviation Div.
MB Mfg. Co.
Ozone Metal Products Corp.
Robinson Aviation, Inc.
Royal Industries, Inc.
St. Regis Paper Co.
A. T. Stevens Co.
Ucinite Co., The, Div.-United-Carr Fastener Corp.

WASHERS

Abbott Screw & Mfg. Co.
Accurate Electronics Corp., Dept D

. . . missile frame

Acme Mfg. & Gasket Co.
Allied Plastics Supply Corp.
Anchor Packing Co., The
Auburn Mfg. Co., The
Belmont Smelting & Refining Works, Inc.
H. Braun Tool & Instrument Co., Inc.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Corbin Products Div.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
G. M. Dykes Iron Works, Inc.
Enflo Corp.
Excelsior Leather Washer Mfg. Co. Inc.
Federal Screw Products Inc.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Cement Mfg. Co., Div.-Textron Inc.
General Gasket Inc.
Gunnar Laboratories
Hahn & Clay
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Javelin Aircraft Co. Inc.
Pacific Cut Washer Co.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Rubbercraft Corp. of California
Wm. Steinen Mfg. Co.
Swedlow Plastics Co.
Synthane Corp.
Techniques, Inc.
Tricon Mfg. Co.
United Shoe Machinery Corp.
Wrought Washer Mfg. Co.

Brass

Abbott Screw & Mfg. Co.
Accurate Specialties Co. Inc.
Acme Mfg. & Gasket Co.
Affiliated Screw Products Co.
American Brass Co., The
Auburn Mfg. Co., The
Carroll Pressed Metal, Inc.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Circon Component Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Corbin Products Div.
Dayton Mfg. Co., Inc.
Dumont Aircraft Fitting Co.
G. M. Dykes Iron Works, Inc.
Federal Screw Products Inc.
Gasket Mfg. Co., Inc.
Gasket, Packing & Specialty Co. Inc.
General Components Inc.
General Gasket Inc.
Gunnar Laboratories
Hahn & Clay
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
***LAMINATED SHIM CO.**
Pacific Cut Washer Co.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Wm. Steinen Mfg. Co.
Superior Spinning & Stamping Co.
Techniques, Inc.
United Shoe Machinery Corp.
Wrought Washer Mfg. Co.

Ceramic

American Lava Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Bendix Products Div., Bendix Aviation Corp.
Diamonite Products Mfg. Co.
Electric Auto-Lite Co., The
Electronic Mechanics, Inc.
General Cement Mfg. Co., Div.-Textron Inc.
Isolantite Mfg. Corp.
Maryland Lava Co.
Mica Fabricating Co.
Chester Morton Electronics Corp.
Penn Fibre & Specialty Co., Inc.
D. M. Steward Mfg. Co.
Thermo Materials, Inc.
Western Gold & Platinum
Zirconium Corp. of America

Felt

Accurate Electronics Corp., Dept. D
Acme Mfg. & Gasket Co.
Aero Leather Products Co.
Allied Plastics Supply Corp.
American Felt Co.
Auburn Mfg. Co., The
Booth Felt Co. Inc.
Dumont Aircraft Fitting Co.
Excelsior Leather Washer Mfg. Co. Inc.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Cement Mfg. Co., Div.-Textron Inc.
General Gasket Inc.
Walter K. Jaros, Aircrafters
Javelin Aircraft Co. Inc.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Western Felt Works
Wrought Washer Mfg. Co.

Fibre

Abbott Screw & Mfg. Co.
Accurate Electronics Corp., Dept. D
Acme Mfg. & Gasket Co.
Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
Auburn Mfg. Co., The
N. S. Baer Co.
Circon Component Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Dayton Mfg. Co., Inc.
Emerson Plastics Corp.
Engineered Plastics, Inc.
Engineered Products Co., The
Excelsior Leather Washer Mfg. Co. Inc.
Federal Screw Products Inc.
Franklin Fibre-Lamitex Corp.
Gasket Mfg. Co. Inc.
Gasket Packing & Specialty Co. Inc.
General Cement Mfg. Co., Div.-Textron Inc.
General Gasket Inc.
Gunnar Laboratories
Walter K. Jaros, Aircrafters
Javelin Aircraft Co. Inc.
Magnetic Shield Div.-Perfection Mica Co.
Mica Fabricating Co.
Pacific Cut Washer Co.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Spaulding Fibre Co., Inc.
Waldom Electronics Inc.
Wrought Washer Mfg. Co.

Insulating

Accurate Electronics Corp., Dept. D
Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Circon Component Corp.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Dumont Aircraft Fitting Co.
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
Fluorocarbon Co. Inc., The
Franklin Fibre-Lamitex Corp.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co., Inc.
Gatke Corp.
General Cement Mfg. Co., Div.-Textron Inc.
General Gasket Inc.
Gunnar Laboratories
Industrial Engravers Inc.
Walter K. Jaros, Aircrafters
Javelin Aircraft Co. Inc.
Jodee Plastics Co.
Maryland Lava Co.
Mica Fabricating Co.
Pacific Cut Washer Co.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
A. T. Stevens Co.
Synthane Corp.
Tri-Point Plastics Inc.
Wrought Washer Mfg. Co.

Lock

Abbott Screw & Mfg. Co.
Affiliated Screw Products Co.
All Metal Screw Products Co., Inc.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Circon Component Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Corbin Products Div.
R. C. Dudek & Co.
Dumont Aircraft Fitting Co.
Eaton Mfg. Co.
Federal Screw Products Inc.
General Cement Mfg. Co., Div.-Textron Inc.
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Pacific Cut Washer Co.
Penn Fibre & Specialty Co., Inc.
Positive Lock Washer Co., The
Standard Locknut & Lockwasher Inc.
Techniques, Inc.
Wrought Washer Mfg. Co.

Metal

Abbott Screw & Mfg. Co.
Accurate Electronics Corp., Dept D
Accurate Specialties Co. Inc.
Acme Mfg. & Gasket Co.
Affiliated Screw Products Co.
All Metal Screw Products Co., Inc.
Alpha Metals, Inc.
Aluminum Co. of America
American Brass Co., The
American Standard Products, Inc.
Anchor Metal Co. Inc.
Auburn Mfg. Co., The
Autonetics, Div.-North American Aviation, Inc.
Belmont Smelting & Refining Works, Inc.
H. Braun Tool & Instrument Co., Inc.
Carroll Pressed Metal, Inc.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Corbin Products Div.
Danly Machine Specialties, Inc.
Division Lead Co.
G. M. Dykes Iron Works, Inc.
Federal Screw Products Inc.
Gaskets Mfg. Co. Inc.
Gaskets, Packing & Specialty Co., Inc.
General Cable Corp.
General Cement Mfg. Co., Div.-Textron Inc.
General Gasket Inc.
Hahn & Clay
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Javelin Aircraft Co. Inc.
***LAMINATED SHIM CO.**
Pacific Cut Washer Co.
Paul & Beekman, Inc.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Wm. Steinen Mfg. Co.
Superior Spinning & Stamping Co.
Techniques, Inc.
Tricon Mfg. Co.
United Shoe Machinery Corp.
Waldom Electronics Inc.
Wrought Washer Mfg. Co.

Mica

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dumont Aircraft Fitting Co.
Emerson Plastics Corp.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co., Inc.
Walter K. Jaros, Aircrafters
Magnetic Shield Div.-Perfection Mica Co.
Mica Fabricating Co.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Wrought Washer Mfg. Co.

Plastic

Accurate Electronics Corp., Dept D
Acme Mfg. & Gasket Co.
Allied Plastics Supply Corp.
American Agile Corp.
Auburn Mfg. Co., The
N. S. Baer Co.
Chicago Gasket Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corbin Products Div.
Crystal-X Corp.
Dixon Corp.
Dumont Aircraft Fitting Co.
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
Flexrock Co
Franklin Fibre-Lamitex Corp.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Cement Mfg. Co., Div.-Textron Inc.
General Components Inc.
General Gasket Inc.
Hastings Plastics Inc.
Industrial Engravers Inc.
Walter K. Jaros, Aircrafters
Javelin Aircraft Co. Inc.
Jodee Plastics Co.
J. E. Menaugh Co.
New England Tape Co. Inc.
Pacific Cut Washer Co.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Roberts Toledo Rubber Co., The
Rogers Corp.
St. Regis Paper Co.
Silicone Insulation, Inc.
Sparta Mfg. Co.
Spaulding Fibre Co., Inc.
Swedlow Plastics Co.
Synthane Corp.
Tri-Point Plastics Inc.
Truxton Industries, Inc.
Virginia Plak Co.
Waterbury Companies, Inc.

Rubber

Acme Mfg. & Gasket Co.
Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
Anchor Packing Co., The
Auburn Mfg. Co., The

Chicago-Allis Mfg. Corp.
Connecticut Hard Rubber Co., The
Continental Rubber Works
Corbin Products Div.
Excelsior Leather Washer Mfg. Co. Inc.
Federal Screw Products Inc.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Gasket Inc.
Javelin Aircraft Co. Inc.
Pacific Moulded Products Co.
Parker Aircraft Co.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Raybestos-Manhattan, Inc.
Roberts Toledo Rubber Co., The
Rogers Corp.
Rubbercraft Corp. of California
A. T. Stevens Co.
Western Felt Works

WATER INJECTION EQUIPMENT

Aero Supply Mfg. Co., Inc.
Auto-Control Labs., Inc.
Bendix Products Div., Bendix Aviation Corp.
Eddington Metal Specialty Co.
Engineered Products Co., The
Walter J. Hyatt Co., The
Hydra-Power Corp.
Javelin Aircraft Co., Inc.
Koehler Aircraft Products Co., Inc.
National Airoil Burner Co.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

WAX

Biwax Corp.
Esso Standard Oil Co.
General Cement Mfg. Co., Div.-Textron Inc.
International Wax Refining Co.
Merix Chemical Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Trio Chemical Works, Inc.
United Shoe Machinery Corp.
Zophar Mills, Inc.

WIRE

Allied Plastics Supply Corp.
American Super-Temperature Wires, Inc.
Belden Mfg. Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
Bridgeport Brass Co.
Carpenter Steel Co., The
Chase Brass & Copper Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Crucible Steel Co. of America
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Engelhard Industries Inc., D. E. Makepeace Div.
Fort Wayne Metals, Inc.
Haynes Stellite Co., Div.-Union Carbide Corp.
***HUDSON WIRFE CO.**
Metals & Controls Corp.
Plastoid Corp.
Republic Steel Corp.
John A. Roeblings Sons Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Thermax Wire Corp.
Thermo Electric Co., Inc.
Titan Metal Mfg. Co.
***WASHINGTON ALUMINUM CO., INC.**
Western International Co.

Aluminum

All-State Welding Alloys Co., Inc.
Aluminum Co. of America
American Steel & Wire Div.-United States Steel Corp.
Anchor Metal Co., Inc.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Bridgeport Brass Co.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Elmet Div.-North American Philips Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
General Cable Corp.
***HUDSON WIRE CO.**
Kaiser Aluminum & Chemical Sales, Inc.
La Pointe Industries, Inc.
Okonite Co., The
Plastoid Corp.
John A. Roeblings Sons Corp.
South River Metal Products Co., Inc.
Warren Wire Co.
***WASHINGTON ALUMINUM CO., INC.**
Western Gold & Platinum

Copper, Bare

Alpha Wire Corp.
American Brass Co., The
American Electric Cable Co.
American Steel & Wire Div.-United States Steel Corp.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
Bram Metallurgical & Chemical Co.
Chase Brass & Copper Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Copperweld Steel Co., Wire & Cable Div.
Electric Auto-Lite Co., The
Elmet Div.-North American Philips Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Essex Wire Corp., Magnet Wire Div.
General Cable Corp.
***HUDSON WIRE CO.**
National Standard Co.
New England Electrical Works, Inc.
John A. Roeblings Sons Corp.
Sequoia Wire Co.
Sittler Corp.
Warren Wire Co.
Western International Co.

Copper-Clad

Accurate Insulated Wire Corp.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Copperweld Steel Co., Wire & Cable Div.
Crucible Steel Co. of America
Dayton Aircraft Products, Inc.
Electric Auto-Lite Co., The
Engelhard Industries Inc., D. E. Makepeace Div.
General Cable Corp.
***HUDSON WIRE CO.**
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Radix Wire Co.
John A. Roeblings Sons Corp.
Standard Metals Corp.
Sylvania Electric Products Inc., Parts Div.

Copper, Insulated

Accurate Insulated Wire Corp.
Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
American Steel & Wire Div.-United States Steel Corp.
Ansonia Wire & Cable Co., The
Barker Sales Co.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
Bram Metallurgical & Chemical Co.
William Brand & Co., Inc.
Chase Brass & Copper Co., Inc.
Consolidated Wire & Associated Companies
Copperweld Steel Co., Wire & Cable Div.
Electric Auto-Lite Co., The
Electric Parts Corp.
Elmet Div.-North American Philips Co., Inc.
Essex Wire Corp.
Essex Wire Corp., Magnet Wire Div.
General Cable Corp.
Hitemp Wires Inc.
New England Electrical Works, Inc.
***NORMANDY ELECTRIC WIRE CORP.**
Okonite Co., The
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Radix Wire Co.
Rex Corp., The
John A. Roeblings Sons Corp.
Royal Electric Corp.
Sequoia Wire Co.
Sittler Corp.
Surprenant Mfg. Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western International Co.

Cut and Stripped

Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Super-Temperature Wires, Inc.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Consolidated Wire & Associated Companies
Electric Auto-Lite Co., The
Electric Parts Corp.
First Electronics Corp., The
General Cable Corp.
***HUDSON WIRE CO.**
Industrial Wiring & Cable Co.
Packard Electric Div.-General Motors Corp.
Peerless Products Industries
Precision Tube Co., Inc.
Radix Wire Co.
Royal Electric Corp.
Sittler Corp.
Thermax Wire Corp.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western International Co.

Enameled

Alpha Wire Corp.
American Steel & Wire Div.-United States Steel Corp.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
Bram Metallurgical & Chemical Co.
Chase Brass & Copper Co., Inc.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Elmet Div.-North American Philips Co., Inc.
Essex Wire Corp., Magnet Wire Div.
General Cable Corp.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
New England Electrical Works, Inc.
John A. Roeblings Sons Corp.
Secon Metals Corp.
Sittler Corp.
Warren Wire Co.

Fine Wire Specialties

Accurate Specialties Co. Inc.
Alpha Wire Corp.
American Electric Cable Co.
American Steel & Wire Div.-United States Steel Corp.
Art Wire & Stamping Co.
Barker Sales Co.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
Bram Metallurgical & Chemical Co.
Carpenter Steel Co., The
Chester Cable Corp.
Consolidated Wire & Associated Companies
Crucible Steel Co. of America
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Elmet Div.-North American Philips Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
General Cable Corp.
Hitemp Wires, Inc.
Leetronics, Inc.
National-Standard Co.
J. M. Ney Co., The
Rex Corp., The
John A. Roeblings Sons Corp.
Secon Metals Corp.
Sequoia Wire Co.
Standard Metals Corp.
Surprenant Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Thermax Wire Corp.
Warren Wire Co.
Western International Co.

Forms

Accurate Insulated Wire Corp.
Accurate Specialties Co. Inc.
American Steel & Wire Div.-United States Steel Corp.
Anchor Metal Co. Inc.
Art Wire & Stamping Co.
W. L. Barrett Co., The
Belden Mfg. Co.
J. P. DeVine Mfg. Co.
Electric Auto-Lite Co., The
Engelhard Industries Inc., D. E. Makepeace Div.
Leach & Garner Co., Industrial Div.
Mid-West Spring Mfg. Co.
Newcomb Spring of Conn. Inc.
Radix Wire Co.
Sohl Co., The
Sylvania Electric Products Inc., Parts Div.

Glass Insulated

Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Super Temperature Wires Inc.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Chase Brass & Copper Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Essex Wire Corp., Magnet Wire Div.
General Cable Corp.
Hitemp Wires, Inc.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
John A. Roeblings Sons Corp.
Royal Electric Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Warren Wire Co.
Western International Co.

Guy

American Steel & Wire Div.-United States Steel Corp.
Barker Sales Co.
Bergen Wire Rope Co.

. . . missile frame

Boston Insulated Wire & Cable Co.
Copperweld Steel Co., Wire & Cable Div.
General Cable Corp.
***HUDSON WIRE CO.**
Walter K. Jaros, Aircrafters
National Standard Co.
John A. Roeblings Sons Corp.
Wind Turbine Co.

Mesh

American Steel & Wire Div.-United States Steel Corp.
J. Bishop & Co., Platinum Works
Cambridge Wire Cloth Co., The
Chase Brass & Copper Co., Inc.
General Cable Corp.
***HUDSON WIRE CO.**
National-Standard Co.
Techniques, Inc.

Metal Plated

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Steel & Wire Div.-United States Steel Corp.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Bram Metallurgical & Chemical Co.
Chester Cable Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
General Cable Corp.
***HUDSON WIRE CO.**
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
National-Standard Co.
Standard Metals Corp.
Sylvania Electric Products Inc., Parts Div.

Metal Shielded

Accurate Insulated Wire Corp.
Alpha Wire Corp.
American Super Temperature Wires Inc.
Berkshire Electric Cable Co.
Bram Metallurgical & Chemical Co.
William Brand & Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Co-Operative Industries, Inc.
Electric Auto-Lite Co., The
Engelhard Industries Inc., D. E. Makepeace Div.
General Cable Corp.
Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Precision Tube Co., Inc.
Radix Wire Co.
Rex Corp., The
Royal Electric Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Thermax Wire Corp.

Molybdenum

Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Eisler Engrg. Co., Inc.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
***HUDSON WIRE CO.**
Johnston & Funk Titanium Corp.
Micro-Wire Tungsten & Molybdenum Products

Monel

Bios Labs., Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
Wilbur B. Driver Co.
***HUDSON WIRE CO.**
Walter K. Jaros, Aircrafters
Johnston & Funk Titanium Corp.
Radix Wire Co.
Sylvania Electric Products Inc., Parts Div.

Nickel Clad Copper

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Belden Mfg. Co.
Bios Labs., Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
General Cable Corp.
***HUDSON WIRE CO.**
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Standard Metals Corp.
Sylvania Electric Products Inc., Parts Div.

Phosphor Bronze

Alpha Wire Corp.
American Brass Co., The
Belden Mfg. Co.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
Consolidated Wire & Associated Companies
Engelhard Industries Inc., D. E. Makepeace Div.
General Cable Corp.
Hackensack Cable Corp.
***HUDSON WIRE CO.**
Radix Wire Co.

Plastic Insulated

Accurate Insulated Wire Corp.
Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Barker Sales Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
William Brand & Co., Inc.
Chase Brass & Copper Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Dayton Aircraft Products, Inc.
Electric Auto-Lite Co., The
Electric Parts Corp.
Essex Wire Corp., Magnet Wire Div.
General Cable Corp.
General Electric Co.
Hitemp Wires, Inc.
New England Tape Co. Inc.
J. M. Ney Co., The
Okonite Co., The
Packard Electric Div. General Motors Corp.
Plastoid Corp.
Rex Corp., The
John A. Roeblings Sons Corp.
Royal Electric Corp.
Sequoia Wire Co.
Sittler Corp.
Surprenant Mfg. Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western International Co.
Wire Co. of America, Inc.

Recording

American Steel & Wire Div.-United States Steel Corp.
Bios Labs., Inc.
Western International Co.

Reels

Bios Labs., Inc.
Electric Auto-Lite Co., The
***HUDSON WIRE CO.**
Thieblot Aviation Co., Div.-Vitro Corp. of America

SILICON BRONZE

Alpha Wire Corp.
American Brass Co., The
Belden Mfg. Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
Hackensack Cable Corp.
***HUDSON WIRE CO.**
Radix Wire Co.

Silver Plated

Alpha Wire Corp.
American Electric Cable Co.
Anchor Metal Co. Inc.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Eastern Smelting & Refining Corp.
Elmet Div.-North American Philips Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
National Standard Co.
Sequoia Wire Co.
Standard Metals Corp.
Surprenant Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Times Wire & Cable Co., Inc.
Western International Co.

Stainless Steel

All Boro Metal Products Co., Inc.
American Steel & Wire Div.-United States Steel Corp.
Armco Steel Corp.
Bios Labs., Inc.
Boston Insulated Wire & Cable Co.
Bram Metallurgical & Chemical Co.
Carpenter Steel Co., The
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Electric Steel Foundry Co.
Firth Sterling, Inc.
Fort Wayne Metals, Inc.
Walter K. Jaros, Aircrafters
Johnston & Funk Titanium Corp.
National-Standard Co.
Republic Steel Corp.
John A. Roeblings Sons Corp.
Joseph T. Ryerson & Son, Inc.
Sylvania Electric Products Inc., Parts Div.
United States Steel Corp.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America

Strippers, Mechanical

Electric Auto-Lite Co., The
Eraser Co., Inc., The
Metals & Controls Corp.

Tantalum

Belden Mfg. Co.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Wilbur B. Driver Co.
Fansteel Metallurgical Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Johnston & Funk Titanium Corp.
Kennametal Inc.
Metals & Controls Corp.

Titanium

Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
Wilbur B. Driver Co.
Eisler Engrg. Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Firth Sterling Inc.
Johnston & Funk Titanium Corp.
***MALLORY-SHARON METALS CORP.**
Metals & Controls Corp.
Titanium Metals Corp. of America

Tungsten

Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Eisler Engrg. Co., Inc.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
Fromson Orban Co., Inc.
Micro-Wire Tungsten & Molybdenum Products

WIRE MARKING, SERVICE

Ackerman Gould Co.
Acromark Co., The
Aerodex, Inc.
Alpha Wire Corp.
Artos Engrg. Co.
Birnbach Radio Co., Inc.
W. H. Brady Co.
William Brand & Co., Inc.
Electric Auto-Lite Co., The
Essex Mfg. Co., Inc.
Hitemp Wires, Inc.
Industrial Wiring & Cable Co.
Manger Electric Co.
Rowe Industries
Sheltered Workshop
Warren Wire Co.
Westline Products Div., Western Lithograph Co.
Zippertubing Co., The

WIRE STRIPPERS

Alpha Metals, Inc.
Artos Engrg. Co.
Blonder-Tongue Labs., Inc.
Electric Auto-Lite Co., The
Eraser Co., Inc., The
Holub Industries, Inc.
Ideal Industries, Inc.
Reeve Electronics, Inc.
Sittler Corp.
Wenco Mfg. Co.

ZINC

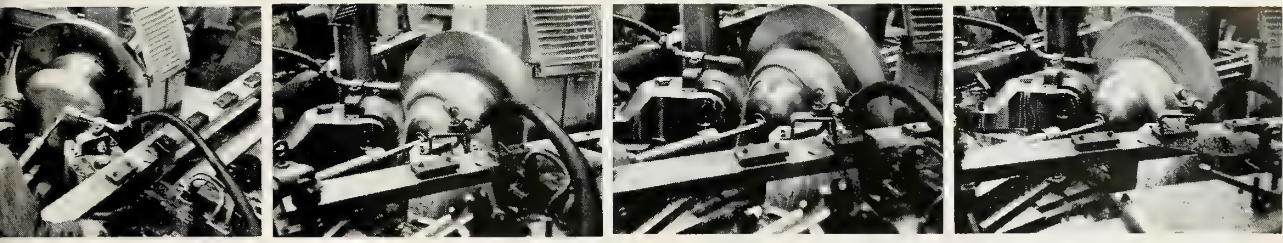
Accurate Specialties Co. Inc.
American Silver Co.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
***COOPER DEVELOPMENT CORP.**
Division Lead Co.
Eagle-Picher Co., The
Harmon, Lichtenstein & Co.
Johnson Mfg. Co., Inc.
London Chemical Co., Inc.

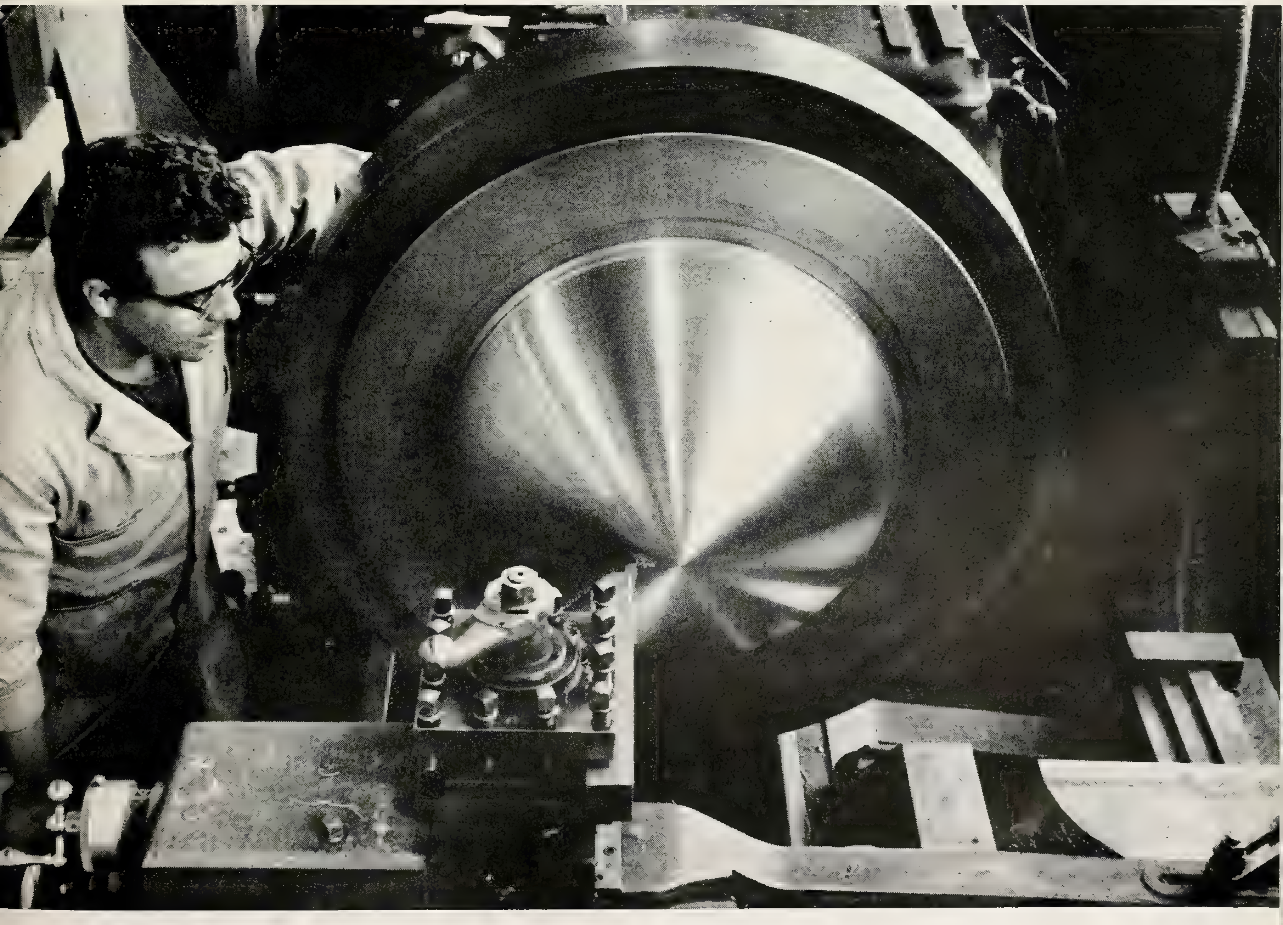
ZIRCONIUM

American Silver Co.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Carborundum Metals Co., The
Engelhard Industries Inc., D. E. Makepeace Div.
Firth Sterling Inc.
Foote Mineral Co.
Harvey Aluminum
Johnston & Funk Titanium Corp.
***MALLORY-SHARON METALS CORP.**
Metals & Controls Corp.

WARHEAD AND NOSE CONE

The warhead and nose cone contain the payload (nuclear, high explosive, or instruments in the case of research missiles) and the shell or cone that encases it. These are highly specialized components, representing nearly all the technologies encountered in the missile itself.





Avco and the Business End of the ICBM

Avco scientists have been feeding nose cone information into the Air Force ICBM program for the past 3 years, and have been responsible for major theoretical breakthroughs on the reentry problem.

As a prime contractor on the *Titan* ICBM, Avco has constructed prototypes of the nose cone which embody these critically important breakthroughs, and the "hardware" program based on these advances continues its steady progress.

Avco
Research & Advanced Development

WARHEAD AND NOSE CONE

ACTUATORS

Aeroproducts Operations, Allison Div., General Motors Corp.
Airborne Accessories Corp.
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Arkwin Industries, Inc.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Atlantic Research Corp.
Beckman & Whitley, Inc., Missile Products Div.
Bridgwater Machine Co.
CDC Control Services, Inc.
Cadillac Gage Co.
Clary Dynamics
Clemco Aero Products, Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Conax Corp.
***COOPER DEVELOPMENT CORP.**
Joe Davidson & Associates
***DIVERSEY ENGRG. CO.**
***EASTERN INDUSTRIES, INC.**
Eclipse-Pioneer Div., Bendix Aviation Corp.
***ELECTROL INC.**
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
Foote Brothers Gear & Machine Corp.
Fulton-Irgon Corp., The
Garrett Corp., The, Airesearch Mfg. Divs.
Geartronics Corp.
General Nuclear Corp.
B. F. Goodrich Aviation Products
Gray & Huleguard, Inc.
Hallamore Electronics Co.
***A. W. HAYDON CO., THE**
Hoover Electric Co.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Hupp Aviation Co.
Hydra-Power Corp.
Javelin Aircraft Co. Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kemp Aero Products, Div.-Kemp Inc.
Lear, Inc., Grand Rapids Div.
Lyndon Aircraft, Inc.
Marquardt Aircraft Co.
Master Specialties Co.
J. A. Maurer, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Nemeth, Inc.
O & M Machine Co., Inc.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Phaostron Instrument & Electronic Co.
Propellex Chemical Corp.
Raymond Engrg. Laboratory, Inc.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Royal Industries, Inc.
Smith-Morris Corp.
Standard Armament Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Tactair Valve Div.-Aircraft Products Co.
Talco Engrg. Co., The
Talley Corp., The
Task Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Trimount Instrument Co.
Vap-Air Div., Vapor Heating Corp.
Vard Inc.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weighing & Control Components, Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

ADHESIVES, HIGH TEMPERATURE

Aries Laboratories, Inc.
Avondale Co., The
Barium & Chemicals, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Bloomingdale Rubber Co.
Carbone Corp., The
Dennis Chemical Co.
Duracote Corp.
Emerson & Cuming, Inc.
General Electric Co., Missile & Ordnance Systems Div.
B. F. Goodrich Industrial Products Co.
Lebec Chemical Corp.
Narmco Resins & Coatings Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Raybestos-Manhattan, Inc.
Rubber & Asbestos Corp.
Sauereisen Cements Co.
Swedlow Plastics Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Vorac Co., The

ADHESIVES, METAL TO METAL

Aries Laboratories, Inc.
Armstrong Products Co.
Avondale Co., The
Bacon Industries, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Bloomingdale Rubber Co.
Dennis Chemical Co.
Emerson & Cuming, Inc.
Fenwal Inc.
Furane Plastics, Inc.
B. F. Goodrich Aviation Products
B. F. Goodrich Industrial Products Co.
Lebec Chemical Corp.
Narmco Resins & Coatings Co.
New England Tape Co. Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Raybestos-Manhattan, Inc.
Rubber & Asbestos Corp.
Sauereisen Cements Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Swedlow Plastics Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
United Shoe Machinery Corp.
Vorac Co., The
X-Pando Corp.

ALARM SYSTEMS

Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Bendix Aviation Corp., York Div.
Briggs Associates, Inc.
CDC Control Services, Inc.
Devco Engrg. Inc.
Electronics Corp. of America
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Fenwal Inc.
Hallamore Electronics Co.
Hammett Electric Co.
***KAHN & CO., INC.**
Master Specialties Co.
Motorola Inc., Military Marketing Div.
Propellex Chemical Corp.
Ryan Aeronautical Co.
Star Engraving Co., Ltd.
Stanley Aviation Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Vap-Air Div., Vapor Heating Corp.
***WESTINGHOUSE ELECTRIC CORP.**

ALLOYS, HIGH PERMEABILITY

American Silver Co.
Bios Labs., Inc.
J. Bishop & Co., Platinum Works
Bram Metallurgical & Chemical Co.
Carpenter Steel Co., The
Crucible Steel Co. of America
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Handy & Harman
Magnetic Shield Div.-Perfection Mica Co.
Thompson Products, Inc.
Titan Metal Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

ANTENNAS, RADIATION TEST

Airborne Instruments Lab., Inc.
All American Aircraft Products, Inc.
American Car & Foundry Div., ACF Industries, Inc.
American Electronic Labs., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Andrew Corp.
Bendix Aviation Corp., York Div.
Canoga Corp. of California
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Gabriel Co., The Gabriel Electronics Div.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Haller Raymond & Brown Inc.
Hycon Eastern Inc.
J-V-M Microwave Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
La Pointe Industries Inc.
McMillan Industrial Corp.
Microwave Electronics Div., Sperry Gyroscope Co.
Motorola Inc., Military Marketing Div.
Republic Aviation Corp., Guided Missiles Div.
Roflan Co., The
Technical Appliance Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Twix Mfg. Co., Inc.
Westbury Electronics Inc.

ASSEMBLY SHIELD, NUCLEAR

ACF Industries, Inc., Advanced Products Div.
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Gasket, Packing & Specialty Co. Inc.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Nuclear Corp. of America, Inc.
Philips & Davies Inc.
Portland Copper & Tank Works Inc.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Telectro Industries Corp.
Thompson Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.

BADGES, RADIATION

Acromark Co., The
Allied Engraving & Stamping Co.
American Electronics, Inc.
Bracke-Seib X-Ray Co., Inc.
Eastman Kodak Corp.
Gerard G. Leeds Co., Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Sohl Co., The

BOLTS, LOCK

***TOWNSEND CO., CHERRY RIVET DIV.**

BOLTS, TOGGLE OR EXPANSION

Affiliated Screw Products Co.
Briles Mfg.
Chase Brass & Copper Co., Inc.
Corbin Products Div.
Hammett Electric Co.
Horst Engrg. & Mfg. Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.

BONDING MATERIALS

Barium & Chemicals, Inc.
Carl Biggs Co.
Dennis Chemical Co.
Emerson & Cuming, Inc.
Handy & Harman
Hastings Plastics Inc.
Horsey, Robson & Co., Inc.
Republic Aviation Corp., Guided Missiles Div.
L. Sonneborn & Sons, Inc., Building Products Div.
Telectro Industries Corp.
X-Pando Corp.

BRAZING ALLOYS

***STAINLESS PROCESSING DIV., WALL COLMONOY CORP.**

CADMIUM

Accurate Specialties Co. Inc.
American Silver Co.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Division Lead Co.
Eagle-Picher Co., The
Harmon, Lichtenstein & Co.

CALCIUM

Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Electronic Mechanics, Inc.
Gladding, McBean & Co.
Harmon, Lichtenstein & Co.

CERAMIC PARTS

American Lava Corp.
Auburn Spark Plug Co., Inc.
Bendix Aviation Corp., York Div.
Bendix Products Div., Bendix Aviation Corp.
Bergen Carbide Co.

PHOTO ON WARHEAD AND NOSECONE DIVIDER PAGE: Nose cone section for an IRBM as it's hydrospun and finish machined at Diversey Engineering Co. This is an example of the kind of new technology that is needed to get missile costs down and keep the industry healthy.

. . . warhead & nose cone

***COOPER DEVELOPMENT CORP.**
Diamonite Products Mfg. Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
[illegible] Mechanics Inc.
Erie Resistor Corp.
General Ceramics Corp.
General Instrument Corp., Defense Products Div.
Gladding, McBean & Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Litton Industries, Components Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Chester Morton Electronics Corp.
Mycalex Corp. of America
National Ceramic Co.
Norton Co.
Nuclear Corp. of America, Inc.
Patterson Foundry & Machine Co., The
D. M. Steward Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Thermo Materials, Inc.
Western Gold & Platinum
Zirconium Corp. of America

CERAMICS

American Lava Corp.
Auburn Spark Plug Co., Inc.
Barium & Chemicals, Inc.
Bendix Products Div., Bendix Aviation Corp.
Corning Glass Works
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Emerson & Cuming, Inc.
Erie Resistor Corp.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
General Instrument Corp., Defense Products Div.
Isolantite Mfg. Corp.
Lapp Insulator Co., Inc., Radio Specialties Div.
Maryland Lava Co.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Morganite, Inc.
Mycalex Corp. of America
National Ceramic Co.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Patterson Foundry & Machine Co., The
Rogers Corp.
Saxonburg Ceramics
Solar Aircraft Co.
Thermo Materials, Inc.
Western Gold & Platinum
Zirconium Corp. of America

COATINGS, FINISHING

Aerodex, Inc.
American Cord & Webbing Co., Inc.
Anachrome Corp.
Avondale Co., The
Bendix Products Div., Bendix Aviation Corp.
Carl Biggs Co.
Connecticut Hard Rubber Co., The
Delta Chemical Works, Inc.
Duracote Corp.
Eagle-Picher Co., The
Electrofilm, Inc.
Emerson & Cuming, Inc.
Fidelity Chemical Products Corp.
Fluorocarbon Co. Inc., The
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Hastings Plastics Inc.
Linde Co., Div.-Union Carbide
L. Sonneborn & Sons, Inc., Building Products Div.
Vorac Co., The

COATINGS, HIGH TEMPERATURE

Amercoat Corp.
American Cord & Webbing Co., Inc.
Anachrome Corp.
Aries Laboratories, Inc.
Atlantic Research Corp.
Avondale Co., The
Barium & Chemicals, Inc.
Bart Mfg. Corp.
Bendix Products Div., Bendix Aviation Corp.
Carl Biggs Co.
Carbone Corp., The
Connecticut Hard Rubber Co., The
Consolidated Electrodynamics Corp.
***COOPER DEVELOPMENT CORP.**
Delta Chemical Works, Inc.
Drilube Co.
Duracote Corp.
Eagle-Picher Co., The
Electrofilm, Inc.
Emerson & Cuming, Inc.
Enflo Corp.
Fluorocarbon Co., Inc., The
General Plastics Corp. of New Jresey
Gulton Industries, Inc.
Hastings Plastics Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Industrial Metal Protectives, Inc.
Joclin Mfg. Co.
Kemp Inc.
Lebec Chemical Corp.
Linde Co., Div.-Union Carbide
Marquardt Aircraft Co.
Morganite, Inc.
Narmco Resins & Coatings Co.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Sauereisen Cements Co.
Sel-Rex Corp.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Swedlow Plastics Co.
Arthur Tickle Engrg. Works, Inc.
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Vorac Co., The
Waldom Electronics Inc.
Zirconium Corp. of America

COATINGS, PROTECTIVE

Amercoat Corp.
American Cord & Webbing Co., Inc.
Anachrome Corp.
Arco Co., The
Aries Laboratories, Inc.
Avondale Co., The
Bendix Products Div., Bendix Aviation Corp.
Carl Biggs Co.
Connecticut Hard Rubber Co., The
Delta Chemical Works, Inc.
Dennis Chemical Co.
Drilube Co.
Duracote Corp.
Eagle-Picher Co., The
Electrofilm, Inc.
Emerson & Cuming, Inc.
Enflo Corp.
Esso Standard Oil Co.
General Plastics Corp. of New Jersey
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
Horsey, Robson & Co., Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Industrial Metal Protectives, Inc.
Joclin Mfg. Co.
Kano Labs.
Kelsey-Hayes Co.
Krylon, Inc.
Lebec Chemical Corp.
Linde Co., Div.-Union Carbide
Narmco Resins & Coatings Co.
New England Tape Co. Inc.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Raybestos-Manhattan, Inc.
Sauereisen Cements Co.
Seal-Peel, Inc.
Sel-Rex Corp.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Sparta Mfg. Co.
Swedlow Plastics Co.
Arthur Tickle Engrg. Works, Inc.
Trio Chemical Works, Inc.
Turco Products, Inc.
United Shoe Machinery Corp.
Vorac Co., The
Western Coating Co.
White & Bagley Co., The
X-Pando Corp.

COATINGS, SALT SPRAY RESISTANCE

Amercoat Corp.
Anachrome Corp.
Avondale Co., The
Carl Biggs Co.
Delta Chemical Works, Inc.
Dennis Chemical Co.
J. P. DeVine Mfg. Co.
Drilube Co.
Duracote Corp.
Electrofilm, Inc.
Emerson & Cuming, Inc.
Fidelity Chemical Products Corp.
Fluorocarbon Co. Inc., The
General Plastics Corp. of New Jersey
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
Industrial Metal Protectives, Inc.
Joclin Mfg. Co.
Kelsey-Hayes Co.
Krylon, Inc.
Lebec Chemical Corp.
Linde Co., Div.-Union Carbide
Narmco Resins & Coatings Co.
New England Tape Co. Inc.
Sauereisen Cements Co.
Seal-Peel, Inc.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
Synthane Corp.
Tube Reducing Corp.
Turco Products, Inc.
Vorac Co., The
Western Coating Co.
X-Pando Corp.

COATINGS, SPECIAL PURPOSE

Amercoat Corp.
American Optical Co., Instrument Div.
Anachrome Corp.
Atlantic Research Corp.
Carl Biggs Co.
Blaco Mfg. Co.
Carbone Corp., The
Delta Chemical Works, Inc.
Dennis Chemical Co.
Drilube Co.
Duracote Corp.
Electrofilm, Inc.
Fidelity Chemical Products Corp.
General Plastics Corp. of New Jersey
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Industrial Metal Protectives, Inc.
Kelsey-Hayes Co.
Kemp, Inc.
Lebec Chemical Corp.
Linde Co., Div.-Union Carbide
New England Tape Co., Inc.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Penetone Co., The
Sel-Rex Corp.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
Sparta Mfg. Co.
Arthur Tickle Engrg. Works, Inc.
United Shoe Machinery Corp.
Vorac Co., The
Wollensak Optical Co.
Zirconium Corp. of America

COBALT

Avondale Co., The
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
National Engrg. Products, Inc.

COMPOUNDS, CALKING & SEALING

Arco Co., The
Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Carl Biggs Co.
Delta Chemical Works, Inc.
Drilube Co.
B. F. Goodrich Industrial Products Co.
Magnetic Shield Div.-Perfection Mica Co.
National Engrg. Products, Inc.
Parker-Hannifin Corp.
Reichhold Chemicals, Inc.
Sauereisen Cements Co.
Seal-Peel, Inc.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
L. Sonneborn & Sons, Inc., Building Products Div.
Topper Mfg. Co., Inc.
United Shoe Machinery Corp.
Western Coating Co.
X-Pando Corp.
Zophar Mills Inc.

COMPOUNDS, POTTING

Bacon Industries, Inc.
Carl Biggs Co.
Biwax Corp.
Delta Chemical Works, Inc.
Dennis Chemical Co.
Narmco Resins & Coatings Co.
National Engrg. Products, Inc.
New England Tape Co. Inc.
Nopco Chemical Co.
Sauereisen Cements Co.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Topper Mfg. Co., Inc.
Zophar Mills Inc.

COMPOUNDS, WATERPROOFING

Avondale Co., The
Barium & Chemicals, Inc.
***BAUSCH & LOMB OPTICAL CO.**
Belmont Smelting & Refining Works, Inc.
Carl Biggs Co.
Biwax Corp.
Calcor Corp., Aircraft Div.
Delta Chemical Works, Inc.
Duracote Corp.
B. F. Goodrich Industrial Products Co.
Hicks Corp., The
Horsey, Robson & Co., Inc.
Nopco Chemical Co.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
L. Sonneborn & Sons, Inc., Building Products Div.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Topper Mfg. Co., Inc.
Trio Chemical Works, Inc.
Union Asbestos & Rubber Co.
United Shoe Machinery Corp.
X Pando Corp.
Zophar Mills Inc.

CONES, METAL

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
American Car & Foundry Div., ACF Industries, Inc.
American Welding & Mfg. Co., The
Atlantic Research Corp.
Morris Bean & Co.
***COOPER DEVELOPMENT CORP.**
Corning Glass Works
Cuno Engrg. Corp., The
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Foote Brothers Gear & Machine Corp.
G. W. Galloway Co.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Ludwig Honold Mfg. Co.
Hupp Aviation Co.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kling Metal Spinning & Stamping Co.
La Pointe Industries Inc.
***LAVELLE AIRCRAFT CORP.**
Longren Aircraft Co., Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Magline Inc.
Magnetic Shield Div.-Perfection Mica Co.
P. R. Mallory & Co. Inc.
Modglin Co. Inc.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
***PHOENIX PRODUCTS CO.**
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Rohr Aircraft Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
Size Control Co.
Smith-Morris Corp.
Solar Aircraft Co.
Spincraft, Inc.
Superior Spinning & Stamping Co.
Thompson Products, Inc.
Titanium Metals Corp. of America
Turbo Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United States Chemical Milling Corp.
Vard Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

CONTROLS, MATERIALS THICKNESS

Briggs Associates, Inc.
Cleveland Instrument Co.
Electronic Control Corp.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Size Control Co.

DIE CASTINGS

Aluminum Co. of America.
American Car & Foundry Div., ACF Industries, Inc.
Anchor Metal Co. Inc.
Bendix Foundries, Bendix Aviation Corp.
Belmont Smelting & Refining Works, Inc.
Bendix Products Div., Bendix Aviation Corp.
Dale Products, Inc.
Dow Chemical Co., The
Electric Auto-Lite Co., The
Walter K. Jaros, Aircrafters
Magline Inc.
Stewart-Warner Corp.
Titan Metal Mfg. Co.
United Mfg. Co., The

DISSIPATORS, HEAT

***AMERICAN MACHINERY & FOUNDRY CO.**
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Gasket, Packing & Specialty Co. Inc.
General Railway Signal Co.
Ronan & Kunzl Inc., Cryogenic Div.
Telectro Industries Corp.
Trane Co., The

DROP FORGINGS

Aircraft Mechanics, Inc.
Aluminum Co. of America
American Brake Shoe Co.
American Car & Foundry Div., ACF Industries, Inc.
American Steel Foundries, Hammond Div.
Bendix Products Div., Bendix Aviation Corp.
***BILLINGS & SPENCER CO., THE**
***CAMERON IRON WORKS, INC.**
Capewell Mfg. Co.
Columbus Bolt & Forging Co.
Crucible Steel Co. of America
Dirilyte Co. of America, Inc.
G. M. Dykes Iron Works, Inc.
Endicott Forging & Mfg. Co., Inc.
Harrisburg Steel Co.
Walter K. Jaros, Aircrafters
Kelsey-Hayes Co.
Ladish Co.
Pettibone Mulliken Corp.
Sel-Rex Corp.
Steel Improvement & Forge Co., The
Thompson Products, Inc.
Transue & Williams Steel Forging Corp.
United Mfg. Co., The
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
***WESTINGHOUSE ELECTRIC CORP.**
J. H. Williams Co.
Wyman-Gordon Co.

ELECTROPLATING EQUIPMENT

Aerodex, Inc.
Bogue Electric Mfg. Co.
Electric Auto-Lite Co., The
Green Rectifier Co.
Hammett Electric Co.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Seal-Peel, Inc.
Western Coating Co.
***WESTINGHOUSE ELECTRIC CORP.**

EMBEDDED ASSEMBLIES

Airflyte Electronics Co.
Allied Engraving & Stamping Co.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Bacon Industries, Inc.
Bendix Aviation Corp., York Div.
Cleveland Metal Specialties Co.
***COOPER DEVELOPMENT CORP.**
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Electronic Techniques, Inc.
Precision, Inc.
Sohl Co., The
Telectro Industries Corp.
Tempo Instrument Inc.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
Ultradyne, Inc.

FINISHERS, PLASTIC

Allied Engraving & Stamping Co.
American Agile Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Avondale Co., The
Dale Products, Inc.
Duracote Corp.
Dwyer Engrg. Co., Inc.
Electric Auto-Lite Co., The
Electronic Techniques, Inc.
Emerson Plastics Corp.
Erie Resistor Corp.
General Cement Mfg. Co., Div.-Textron Inc.
General Plastics Corp. of New Jersey
Hastings Plastics Inc.
Jodee Plastics Co.
Walter Lee Chemical Corp.
***LONE STAR PLASTICS CO. INC.**
J. J. Monaghan Co., Inc.
O & S Research, Inc.
Silicone Insulation, Inc.
Swedlow Plastics Co.
Topper Mfg. Co., Inc.
Truxton Industries, Inc.

FINISHES, LUMINOUS MATERIALS

Avondale Co., The
Canadian Radium & Uranium Corp.
General Cement Mfg. Co., Div.-Textron Inc.
Star Engraving Co., Ltd.
United States Radium Corp.

FUSES, ELECTRIC

American Brass Co., The
***AMERICAN MACHINE & FOUNDRY CO.**
Atlantic Research Corp.
Bussmann Mfg. Div., McGraw-Edisonco.
Greenleaf Mfg. Co., The., Div.-Mandrel Industries Inc.
Hammett Electric Co.
Librascope Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Royal Electric Corp.
Stromberg-Carlson, Electronics Div.
Uniwave, Inc.

FUSES, ELECTRONIC, MISSILES

***AMERICAN MACHINE & FOUNDRY CO.**
Atlantic Research Corp.
Bendix Aviation Corp., York Div.
Bussmann Mfg. Div., McGraw-Edison Co.
Cleveland Metal Specialties Co.
Collins Radio Co.
***COOPER DEVELOPMENT CORP.**
Dwyer Engrg. Co., Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Elgin National Watch Co.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Geisler Labs.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)

MARTIN

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HMS
HARTFORD MACHINE SCREW CO.
Division of Standard Screw Co.
HARTFORD 2, CONNECTICUT

. . . warhead & nose cone

Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hamilton Watch Co., Military Products Div.
Hazeltine Electronics Div.-Hazeltine Corp.
Librascope Inc.
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Motorola Inc., Military Marketing Div.
Pacific Scientific Co.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Ryan Aeronautical Co.
Sightmaster Corp.-Mutual Electronic Industries Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Tempo Instrument Inc.
Uniwave, Inc.
Wave Particle Corp.

FUSES, HYDRAULIC

*AMERICAN MACHINE & FOUNDRY CO.
Conax Corp.
Eddington Metal Specialty Co.
*ELECTROL INC.
Walter J. Hyatt Co., The
Sprague Engrg. Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.

FUSES, PLUG

Alpha Metals, Inc.
American Brass Co., The
Atlantic Research Corp.
Bussmann Mfg. Div., McGraw-Edison Co.
Hammett Electric Co.
Neosil Products Co.
Royal, Electric Corp.

INSULATION, MATERIALS

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crystal-X Corp.
Diamonite Products Mfg. Co.
Duracote Corp.
Eagle-Picher Co., The
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
General Electric Co., Apparatus Sales Div.
Hastings Plastics Inc.
Hays Mfg. Co.
Industrial Mica Corp.
Joclin Mfg. Co.
Maryland Lava Co.
Mycalex Corp. of America
Norton Co.
Penn Fibre & Specialty Co., Inc.
Rex Corp., The
Rogers Corp.
Saxonburg Ceramics
Seaman Products
Silicone Insulation, Inc.
Silicones Div.-Union Carbide Corp.
Sparta Mfg. Co.
Spaulding Fibre Co., Inc.
Swedlow Plastics Co.
Synthane Corp.
H. I. Thompson Fiber Glass Co.
Topper Mfg. Co., Inc.
Union Asbestos & Rubber Co.
Warren Wire Co.

INSULATION PARTS

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Diamonite Products Mfg. Co.
Dixon Corp.
Electronic Mechanics, Inc.
Emerson Plastics Corp.
Enflo Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
General Gasket Inc.
Industrial Mica Corp.
L. O. F. Glass Fibers Co.
Walter Lee Chemical Corp.
Maryland Lava Co.
Mycalex Corp. of America
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Ryan Aeronautical Co.
Saxonburg Ceramics
Silicone Insulation, Inc.
Skytronics
Sparta Mfg. Co.
Spaulding Fibre Co., Inc.
Stevens Products, Inc.
Surprenant Mfg. Co.
Swedlow Plastics Co.
H. I. Thompson Fiber Glass Co.
Topper Mfg. Co., Inc.
Union Asbestos & Rubber Co.
Warren Wire Co.

Ceramic Insulation Parts

Allied Plastics Supply Corp.
American Lava Corp.
Auburn Spark Plug Co., Inc.
B G Corp., The
Bendix Products Div., Bendix Aviation Corp.
*COOPER DEVELOPMENT CORP.
Corning Glass Works
Diamonite Products Mfg. Co.
Electric Auto-Lite Co., The
Electronic Mechanics, Inc.
Erie Resistor Corp.
General Instrument Corp., Defense Products Div.
Heldor Mfg. Co., Inc.
Isolantite Mfg. Corp.
Lapp Insulator Co., Inc., Radio Specialties Div.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
Norton Co.
Rogers Corp.
Saxonburg Ceramics
Skytronics
D. M. Steward Mfg. Co.
TA Mfg. Corp.
Thermo Materials Inc.
Western Gold & Platinum
*WESTINGHOUSE ELECTRIC CORP.
Zirconium Corp. of America

Insulating Sleeves

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
B G Corp., The
Birnbach Radio Co., Inc.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Diamonite Products Mfg. Co.
Dixon Corp.
Electronic Mechanics, Inc.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
General Cable Corp.
General Cement Mfg. Co., Div.-Textron Inc.
General Electric Co., Apparatus Sales Div.
Jodee Plastics Co.
Lamtex Industries, Inc.
Walter Lee Chemical Corp.
Maryland Lava Co.
Mica Fabricating Co.
Mycalex Corp. of America
Penn Fibre & Specialty Co., Inc.
Resistoflex Corp.
Rex Corp., The
Rogers Corp.
Saxonburg Ceramics
Silicone Insulation, Inc.
Surprenant Mfg. Co.
H. I. Thompson Fiber Glass Co.
Varflex Corp.

Rods

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Crystal-X Corp.
Diamonite Products Mfg. Co.
Dixon Corp.
Electronic Mechanics Inc.
Emerson Plastics Corp.
Enflo Corp.
Franklin Fibre-Lamitex Corp.
Isolantite Mfg. Corp.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Mica Fabricating Co.
Mycalex Corp. of America
Penn Fibre & Specialty Co., Inc.
Resistoflex Corp.
Rex Corp., The
Rogers Corp.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Synthane Corp.
Tri-Point Plastics Inc.

Sheets

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Chicago-Allis Mfg. Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Crystal-X Corp.
Dixon Corp.
Emerson Plastics Corp.
Enflo Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Franklin Fibre-Lamitex Corp.
General Gasket Inc.
B. F. Goodrich Aviation Products
Hastings Plastics Inc.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Magnetic Shield Div.-Perfection Mica Co.
Mica Fabricating Co.
New England Laminates Co., Inc.
Pacific Moulded Products Co.
Resistoflex Corp.
Rex Corp., The
Rogers Corp.
Rubbercraft Corp. of California
Seaman Products
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Synthane Corp.

Silicone Rubber

Allied Plastics Supply Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Bacon Industries, Inc.
N. S. Baer Co.
William Brand & Co., Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Continental Rubber Works
Cordo Molding Products, Inc.
Dayton Aircraft Products, Inc.
Delta Chemical Works, Inc.
Duroyd Gasket Mfg. Co.
Electro-Flex Heat, Inc.
Emerson Plastics Corp.
General Gasket Inc.
Hallett Mfg. Co.
Mica Fabricating Co.
Neosil Products Co.
New England Tape Co. Inc.
Pacific Moulded Products Co.
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Rubbercraft Corp. of California
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Skytronics
TA Mfg. Corp.
Varflex Corp.
Western Felt Works

Stampings & Punchings

Abalon Precision Mfg. Corp.
Accurate Electronics Corp., Dept. D
Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Auburn Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
Bergen Carbide Co.
H. Braun Tool & Instrument Co., Inc.
Carroll Pressed Metal, Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dixon Corp.
Duroyd Gasket Mfg. Co.
Electronic Techniques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Emerson Plastics Corp.
Engineered Products Co., The
Gasket Mfg. Co. Inc.
General Gasket Inc.
Heldor Mfg. Co., Inc.
Kling Metal Spinning & Stamping Co.
Micro-Wire Tungsten & Molybdenum Products
Pacific Cut Washer Co.
Parish Pressed Steel, Div.-Dana Corp.
Paul & Beekman, Inc.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Rowe Industries
Ryan Aeronautical Co.
Sinclair Mfg. Co.
Spaulding Fibre Co., Inc.
TA Mfg. Corp.
Transue & Williams Steel Forging Corp.
United-Carr Fastener Corp.
Wrought Washer Mfg. Co.

INSULATORS

Accurate Electronics Corp., Dept. D
Allied Plastics Supply Corp.
American Lava Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Dayton Aircraft Products, Inc.
Dixon Corp.
Electronic Mechanics, Inc.
Emerson Plastics Corp.
Enflo Corp.
Erie Resistor Corp.
Garde Mfg. Co.
Gatke Corp.
General Cement Mfg. Co., Div.-Textron Inc.
Hallett Mfg. Co.
Isolantite Mfg. Corp.
Joclin Mfg. Co.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.

Walter Lee Chemical Corp.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Mycalex Corp. of America
Saxonburg Ceramics
Silicone Insulation, Inc.
Stevens Products, Inc.
Synthane Corp.
Tri-Dex Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wind Turbine Co.

INTERVALOMETERS

American Electronics, Inc.
***COOPER DEVELOPMENT CORP.**
Joe Davidson & Associates
Elektro-Serv Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
***FLIGHT RESEARCH, INC.**
General Controls Co.
Hamilton Watch Co., Military Products Div.
***A. W. HAYDON CO., THE**
Mast Development Co., Inc.
J. A. Maurer, Inc.
Modglin Co. Inc.
Royal Industries, Inc.
Standard Armament Inc.
Tempo Instrument Inc.
Thompson Products, Inc.

MAGNESIUM & ALLOYS

All Boro Metal Products Co., Inc.
Aluminum Co. of America
American Silver Co.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Dow Chemical Co., The
Light Metals, Inc.
Magline Inc.
South River Metal Products Co., Inc.

MERCURY

Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Dynametrics Corp.
Eastern Smelting & Refining Corp.
Hammett Electric Co.
Thompson Products, Inc.

METAL CLAD SHEETS

Allied Plastics Supply Corp.
Alpha Metals, Inc.
Aluminum Co. of America
American Silver Co.
Bomyte Co., The
Bram Metallurgical & Chemical Co.
Continental Diamond Fibre Corp., Sub-The Budd Co.
Dwyer Engrg. Co., Inc.
General Plastics Corp. of New Jersey
Heldor Mfg. Co., Inc.
Leach & Garner Co., Industrial Div.
Lukens Steel Co.
Magnetic Shield Div.-Perfection Mica Co.
Metals & Controls Corp.
New England Laminates Co., Inc.
St. Regis Paper Co.
Synthane Corp.

METAL MACHINING

Abalon Precision Mfg. Corp.
Aerodex, Inc.
Aircraft Mechanics, Inc.
All American Aircraft Products, Inc.
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Ampco Metal, Inc.
Arnolt Corp.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Bergen Carbide Co.
Bridgwater Machine Co.
Bullard Co., The
Champion Airquipment Inc.
C. B. Christiansen Co.
Clausing Div.-Atlas Press Co.
***COOPER DEVELOPMENT CORP.**
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Daystrom Instrument Div., Daystrom, Inc.
J. P. DeVine Mfg. Co.
G. M. Diehl Machine Works
***DIVERSEY ENGRG. CO.**
Dumont Aviation Associates
Dwyer Engrg. Co., Inc.
G. M. Dykes Iron Works, Inc.
Eddington Metal Specialty Co.
Electronic Techniques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Eljay Corp.
Federal Machine Co. Inc.
Freeman Co., The
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
Goodyear Aircraft Corp.
B. H. Hadley, Inc.
Hahn & Clay
Hamilton Watch Co., Military Products Div.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Heldor Mfg. Co., Inc.
Hicks Corp., The
Alfred Hofmann & Co.
Henry & Miller Industries, Inc.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Houston Fearless Corp.
Hupp Aviation Co.
Hydra-Power Corp.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Walter K. Jaros, Aircrafters
Jennings & Co.
Jones & Lamson Machine Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kemp Inc.
Kerns Mfg. Corp.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
Litton Industries, Components Div.
***LYCOMING DIV., AVCO MFG. CORP.**
Lytle Engrg. & Mfg. Co.
Machine Engrg. Co., Inc.
R. C. Mahon Co., The
Mechanical Div.-General Mills, Inc.
Menasco Mfg. Co.
Mercury Air Parts Co., Inc.
Milman Engrg. Co.
J. J. Monagahn Co., Inc.
National Airoil Burner Co.
O & M Machine Co., Inc.
Onsrud Machine Works, Inc.
Ozone Metal Products Corp.
Parish Pressed Steel, Div.-Dana Corp.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Phillips Aviation Co.
Quick Charge Corp.
Rowe Industries
Ryan Aeronautical Co.
***SCREW PRODUCTS CORP. OF AMERICA**
Sesco Mfg., Inc.
Smith-Morris Corp.
Solar Aircraft Co.
South River Metal Products Co., Inc.
Specialties Mfg. Co., Inc.
Stanat Mfg. Co., Inc.
Strata Instrument Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Stanley Aviation Corp.
Talley Corp., The
Technical Oil Tool Corp.
Thompson Products, Inc.
Arthur Tickle Engrg. Works, Inc.
Turbo Products, Inc.
Twix Mfg. Co., Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Mfg. Co., The
United Shoe Machinery Corp.
Universal Metal Products Inc.
Uniwave, Inc.
Vinco Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
Waveguide, Inc.
Weber Aircraft Corp.
Wenco Mfg. Co.
Western Arc Welding, Inc.
Wheland Co., The
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

METAL PARTS

Abalon Precision Mfg. Corp.
Acromark Co., The
All American Aircraft Products, Inc.
Altamil Corp.
American Brass Co., The
American Standard Products, Inc.
Amplex Div.-Chrysler Corp.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Auburn Spark Plug Co., Inc.
Belmont Smelting & Refining Works, Inc.
Bound Brook Oil-Less Bearing Co.
Bridgwater Machine Co.
J. H. Bunnell & Co.
Century Fasteners Corp.
Chicago Screw Co., The, Div.-Standard Screw Co.
Circon Component Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
***COOPER DEVELOPMENT CORP.**
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
J. P. DeVine Mfg. Co.
***DIVERSEY ENGRG. CO.**
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Eljay Corp.
Federal Machine Co. Inc.
Garde Mfg. Co.
B. H. Hadley, Inc.
Hamilton Watch Co., Military Products Div.
Walter K. Jaros, Aircrafters
Kemp Inc.
Kerns Mfg. Corp.
Kling Metal Spinning & Stamping Co.
***LAVEZZI MACHINE WORKS**
Litton Industries, Components Div.
***LYCOMING DIV., AVCO MFG. CORP.**
P. R. Mallory & Co. Inc.
J. A. Maurer, Inc.
Mercury Air Parts Co., Inc.
Metal Masters, Inc.
Ozone Metal Products Corp.
Pacific Cut Washer Co.
Peerless Products Industries
Quick Charge Corp.
Rosan, Inc.
Ryan Aeronautical Co.
St. Marys Carbon Co.
***SCREW PRODUCTS CORP. OF AMERICA**
Seamless Products Co., Inc.
Sinclair Mfg. Co.
Smith-Morris Corp.
Standard Locknut & Lockwasher Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Stanley Aviation Corp.
Sylvania Electric Products Inc., Parts Div.
Titan Metal Mfg. Co.
Torrington Co., The
Twin Coach Co.-Aircraft Div.
United Shoe Machinery Corp.
Universal Metal Products Inc.
Uniwave, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wenco Mfg. Co.
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Wrought Washer Mfg. Co.

Bushings

Amatom Electronic Hardware Co. Inc.
American Brake Shoe Co.
American Non Gran Bronze Co.
American Standard Products, Inc.
American Steel Foundries, Hammond Div.
Ampco Metal, Inc.
Ample Div.-Chrysler Corp.
Associated Co., Inc.
Bergen Carbide Co.
Bound Brook Oil-less Bearing Co.
J. H. Bunnell & Co.
Carbone Corp., The
Century Fasteners Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Corbin Products Div.
Dayton Mfg. Co., Inc.
R. C. Dudek & Co.
Dumont Aviation Associates
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Eljay Corp.
General Cable Corp.
General Components Inc.
Graphite Metallizing Corp.
B. H. Hadley, Inc.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kemp Inc.
La Pointe Industries Inc.
Litton Industries, Components Div.
J. A. Maurer, Inc.
Orange Roller Bearing Co., Inc.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Peerless Products Industries
True Alloys Inc.
Randall Graphite Bearings, Inc.
Rattan Mfg. Co., The
Rosan, Inc.
St. Marys Carbon Co.
***SCREW PRODUCTS CORP. OF AMERICA**
Seamless Products Co., Inc.
Shenango Furnace Co., The, Centrifugally Cast Products Div.
Southwest Products Co.
Springfield Brass Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Wrought Washer Mfg. Co.

Lead

Alpha Metals, Inc.
Anchor Metal Co., Inc.
Belmont Smelting & Refining Works, Inc.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Division Lead Co.
Duroyd Gasket Mfg. Co.
B. H. Hadley, Inc.
Walter K. Jaros, Aircrafters
Keystone Carbon Co.

Powdered

Aluminum Co. of America
Amplex Div.-Chrysler Corp.
Bound Brook Oil-less Bearing Co.
J. H. Bunnell & Co.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Cuno Engrg. Corp., The
Delta Chemical Works, Inc.
Division Lead Co.
Eaton Mfg. Co.
Keystone Carbon Co.
Magnetic Shield Div.-Perfection Mica Co.
P. R. Mallory & Co. Inc.
Mercury Air Parts Co., Inc.
Raybestos-Manhattan Inc.
St. Marys Carbon Co.
Stewart-Warner Corp.
A. U. Stone & Co., Inc.
Superior Carbon Products, Inc.

S. K. Wellman Co., The
Western Automatic Machine Screw Co., Div.-Standard Screw Co.
***WESTINGHOUSE ELECTRIC CORP.**

Screw Machine

A&P Metal Products Mfg. Corp.
Abalon Precision Mfg. Corp.
Aerotron Supply Co.
Affiliated Screw Products Co.
Airborne Research & Development Corp.
All American Aircraft Products, Inc.
Aluminum Co. of America
Amatom Electronic Hardware Co. Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Non Gran Bronze Co.
American Standard Products, Inc.
Arnolt Corp.
Associated Co., Inc.
Auburn Spark Plug Co., Inc.
Bergen Carbide Co.
Bland Burner Co. The
Brighton Tool & Die Co.
Briles Mfg.
J. H. Bunnell & Co.
Century Fasteners Corp.
Chicago Screw Co., The, Div.-Standard Screw Co.
Circon Component Corp.
Clark Equipment Co.
Connector Corp. of America
Corbin Products Div.
Dalmore Corp.
Dumont Aviation Associates
Eddington Metal Specialty Co.
Electronic Techniques, Inc.
Elgin Micronics West Coast Div.-Elgin National Watch Co.
Engineered Products Co., The
Freeman Co., The
General Components Inc
General Findings & Supply Co., Industrial Div.
Goe Engrg. Co.
Hamilton Watch Co., Military Products Div.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Heldor Mfg. Co., Inc.
Alfred Hofmann & Co.
Walter K. Jaros Aircrafters
Kaar Mfg. & Distributing Co., Inc.
Leach & Garner Co., Industrial Div.
Litton Industries, Components Div.
J. A. Maurer, Inc.
Mercury Air Parts Co., Inc.
J. I. Morris Co.
National Lock Co.
Orange Roller Bearing Co., Inc.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
H. K. Porter Inc.
Precise Instrument Parts Co., A Corp.
Research Development Mfg. Inc.
Rosan, Inc.
***SCREW PRODUCTS CORP. OF AMERICA**
Sinclair Mfg. Co.
Skinner Precision Products
Specialties Mfg. Co., Inc.
Herman D. Steel Co.
Wm. Steinen Mfg. Co.
A. U. Stone & Co., Inc.
Standard Locknut & Lockwasher Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Technical Oil Tool Corp.
Titan Metal Mfg. Co.
Torrington Co., The
***UNITED AIRCRAFT PRODUCTS, INC.**
Vemaline Products Co.
Waltham Screw Co.
Wenco Mfg. Co.
Wilmar Mfg. Co., Inc.
Winder Aircraft Corp. of Fla.
J. H. Winn Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

Small Metal Stampings

Abalon Precision Mfg. Corp.
Accurate Electronics Corp., Dept. D
Accurate Specialties Co. Inc.
Acromark Co., The
Aerolite Electronics Corp.
Aircraft Mechanics, Inc.
All American Aircraft Products, Inc.
Alpha Metals, Inc.
Aluminum Co. of America
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Art Wire & Stamping Co.
Associated Co., Inc.
Atlas E-E Corp.
Auburn Mfg. Co., The
Basic Tool Industries, Inc.
Belmont Smelting & Refining Works, Inc.
Bergen Carbide Co.
Blowers Inc.
H. Braun Tool & Instrument Co., Inc.
Butler Mfg. Co.
Carroll Pressed Metal, Inc.
***COMMERCIAL SHEARING AND STAMPING CO.**
Corbin Products Div.
Dayton Mfg. Co., Inc.
J. P. DeVine Mfg. Co.
Dumont Aviation Associates
Electronic Techniques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Eljay Corp.
Elm Mfg. Co. Inc.
Erie Resistor Corp.
Garde Mfg. Co.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Components Inc.
General Findings & Supply Co., Industrial Div.
Hamilton Watch Co., Military Products Div.
Heldor Mfg. Co., Inc.
Hunter Spring Co.
Walter K. Jaros, Aircrafters
Kelsey-Hayes Co.
Kling Metal Spinning & Stamping Co.
***LAMINATED SKIM CO.**
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
Leetronics, Inc.
Longren Aircraft Co., Inc.
Lytle Engrg. & Mfg. Co.
Machine Engrg. Co., Inc.
Malco Tool & Mfg. Co.
Metal Forming Corp.
Metal Masters, Inc.
Micro Wire Tungsten & Molybdenum Products
National Lock Co.
Ozone Metal Products Corp.
Pacific Cut Washer Co.
Parish Pressed Steel, Div.-Dana Corp.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Quick Charge Corp.
Reliable Spring & Wire Forms Co., The
Roland Teiner Co., Inc.
Rowe Industries
Ryan Aeronautical Co.
St. Marys Carbon Co.
Schaffer Air Industries, Inc.
Seamless Products Co., Inc.
Sinclair Mfg. Co.
Smith-Morris Corp.
Solar Aircraft Co.
South River Metal Products Co., Inc.
Specialties Mfg. Co., Inc.
Star Engraving Co., Ltd.
Wm. Steinen Mfg. Co.
Superior Spinning & Stamping Co.
Sylvania Electric Products Inc., Parts Div.
Technical Oil Tool Corp.
Techniques, Inc.
Thompson Products, Inc.
Transue & Williams Steel Forging Corp.
Tricon Mfg. Co.
Turbo Products, Inc.
Twin Coach Co.-Aircraft Div.
Twix Mfg. Co., Inc.
Ucinite Co., The, Div.-United-Carr Fastener Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Shoe Machinery Corp.
United-Carr Fastener Corp.
Waterbury Companies, Inc.
Wayne Foundry & Stamping Co.
Wenco Mfg. Co.
Western Arc Welding, Inc.
Winder Aircraft Corp. of Fla.
J. H. Winn Inc.
Wrought Washer Mfg. Co.

Spinnings

Aluminum Co. of America
Associated Co., Inc.
Dayton Mfg. Co., Inc.
Dean & Benson Research Inc.
***DIVERSEY ENGRG. CO.**
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Heldor Mfg. Co., Inc.
Walter K. Jaros, Aircrafters
Kelsey-Hayes Co.
Kling Metal Spinning & Stamping Co.
La Pointe Industries Inc.
Longren Aircraft Co., Inc.
***PHOENIX PRODUCTS CO.**
Roland Teiner Co., Inc.
Seamless Products Co., Inc.
Solar Aircraft Co.
Spincraft, Inc.
Superior Spinning & Stamping Co.
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
***UNITED AIRCRAFT PRODUCTS, INC.**
United States Chemical Milling Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Trimmings

Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Heldor Mfg. Co., Inc.
La Pointe Industries Inc.
Roll Formed Products Co.
Seamless Products Co., Inc.
Smith-Morris Corp.
Winder Aircraft Corp. of Fla.

METAL STOCK, POROUS BEARING

Amplex Div.-Chrysler Corp.
St. Marys Carbon Co.

METAL STOCK, THERMOSTATIC

American Silver Co.
Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
A. F. Holden Co., The
Metals & Controls Corp.

METAL TREATING

Aerodex, Inc.
Barium & Chemicals, Inc.
J. P. DeVine Mfg. Co.
Hamilton Watch Co., Military Products Div.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Papesch & Kolstad, Inc.
Parish Pressed Steel, Div.-Dana Corp.
H. K. Porter Inc.
Standard Metals Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
Turco Products, Inc.
United Shoe Machinery Corp.
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss Wright Corp.

NICKEL

Accurate Specialties Co., Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Silver Co.
Belmont Smelting & Refining Works, Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America

NUCLEAR SHIELDING, RADIATION

ACF Industries, Inc., Advanced Products Div.
Allied Plastics Supply Corp.
American Agile Corp.
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Silver Co.
Anchor Metal Co. Inc.
Delta Chemical Works, Inc.
Firth Sterling Inc.
G. W. Galloway Co.
Gasket, Packing & Specialty Co. Inc.
Norton Co.
Nuclear Corp. of America, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Thompson Products, Inc.

OXIDE, ALUMINUM

Aluminum Co. of America
American Lava Corp.
Auburn Spark Plug Co., Inc.
B G Corp., The
***COOPER DEVELOPMENT CORP.**
Corning Glass Works
Delta Chemical Works, Inc.
Diamonite Products Mfg. Co.
Electronic Mechanics, Inc.
Linde Co., Div.-Union Carbide
Morganite, Inc.
Chester Morton Electronics Corp.
Norton Co.
Saxonburg Ceramics
C. W. Turk Corp.
Western Gold & Platinum

PARACHUTES

***COOPER DEVELOPMENT CORP.**
Dayton Aircraft Products, Inc.
Security Parachute Co.
Wagner Awning & Mfg. Co., The

PARACHUTE HARDWARE

All American Aircraft Products, Inc.
Amatom Electronic Hardware Co. Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Aviation Developments Inc.
Bridgwater Machine Co.
Capewell Mfg. Co.
Century Fasteners Corp.
***COOPER DEVELOPMENT CORP.**
Corbin Products Div.
Fulton-Irgon Corp., The
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Walter K. Jaros, Aircrafters
Propellex Chemical Corp.
Security Parachute Co.
Waldom Electronics Inc.

PLATES, METAL OR PLASTIC

Acromark Co., The
Aerolite Electronics Corp.
Allied Plastics Supply Corp.
Aluminum Co. of America
Atlantic Engravers, Inc.

Bram Metallurgical & Chemical Co.
Canadian Radium & Uranium Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crucible Steel Co. of America
Henry G. Dietz Co., Inc., The
Dwyer Engrg. Co., Inc.
Electronic Techniques, Inc.
Erie Resistor Corp.
Industrial Engravers Inc.
Jodee Plastics Co.
Kling Metal Spinning & Stamping Co.
M-W Labs., Inc.
Plastic Age Sales, Inc.
Sohl Co., The
Spartan Marking Corp.
Star Engraving Co., Ltd.
Titanium Metals Corp. of America
Truxton Industries, Inc.
United Mfg. Co., The
United States Radium Corp.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America
Virginia Plak Co.
Waterbury Companies, Inc.

PLATING, PRECIOUS METAL

Aerodex, Inc.
Attleboro Refining Co. Inc.
Bart Mfg. Corp.
Bram Metallurgical & Chemical Co.
Circon Component Corp.
Cohan Epner Co. Inc.
Drilube Co.
Harper-Leader, Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Henry & Miller Industries, Inc.
Precision Electroplating Co.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.

QUARTZ, FUSED

American Optical Co., Instrument Div.
*BAUSCH & LOMB OPTICAL CO.
Corning Glass Works
Davidson Mfg. Co.
Delta Chemical Works, Inc.
Hammett Electric Co.
Kemlite Laboratories, Inc.
Mica Fabricating Co.
August E. Miller Laboratories
Patterson, Moos Div.-Universal Winding Co., Inc.
Perkin-Elmer Corp.
Ultra-Violet Products, Inc.

RELEASE MECHANISMS

Aero Supply Mfg. Co., Inc.
Aircraft Armaments, Inc.
Atlantic Research Corp.
Aviation Developments Inc.
Beckman & Whitley, Inc., Missile Products Div.
Bridgwater Machine Co.
Capewell Mfg. Co.
Conax Corp.
Consolidated Controls Corp.
*COOPER DEVELOPMENT CORP.
Dayton Aircraft Products, Inc.
*DIVERSEY ENGRG. CO.
Fulton-Irgon Corp., The
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Gray & Huleguard, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kearfott Co., Inc.
Librascope Inc.
Master Specialties Co.
J. A. Maurer, Inc.
McCormick Selph Associates
Mechanical Div.-General Mills, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Pioneer-Central Div., Bendix Aviation Corp.
Propellex Chemical Corp.
Republic Aviation Corp., Guided Missiles Div.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Royal Industries, Inc.
Stanley Aviation Corp.
Talco Engrg. Co., The
Technical Oil Tool Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Winchester-West. Div.-Olin Mathieson Chem. Corp.

RINGS, SPECIAL

Accurate Specialties Co. Inc.
Advanced Products Co., The
American Welding & Mfg. Co., The
Auburn Mfg. Co., The
Bridgwater Machine Co.
C. B. Christiansen Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dayton Mfg. Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Federal Machine Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
Ladish Co.
La Pointe Industries Inc.
Leetronics, Inc.
J. J. Monaghan Co., Inc.
Pacific Cut Washer Co.
Rubbercraft Corp. of California
Ryan Aeronautical Co.
Simonds Saw & Steel Co.
Size Control Co.
Spincraft, Inc.
Thompson Products, Inc.
Turbo Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.
United States Chemical Milling Corp.
Western Arc Welding, Inc.

RIVETS

Abbott Screw & Mfg. Co.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
Aviation Developments Inc.
Bland Burner Co., The
Briles Mfg.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Circon Component Corp.
Corbin Products Div.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Federal Screw Products Inc.
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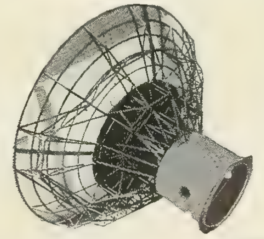

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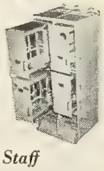

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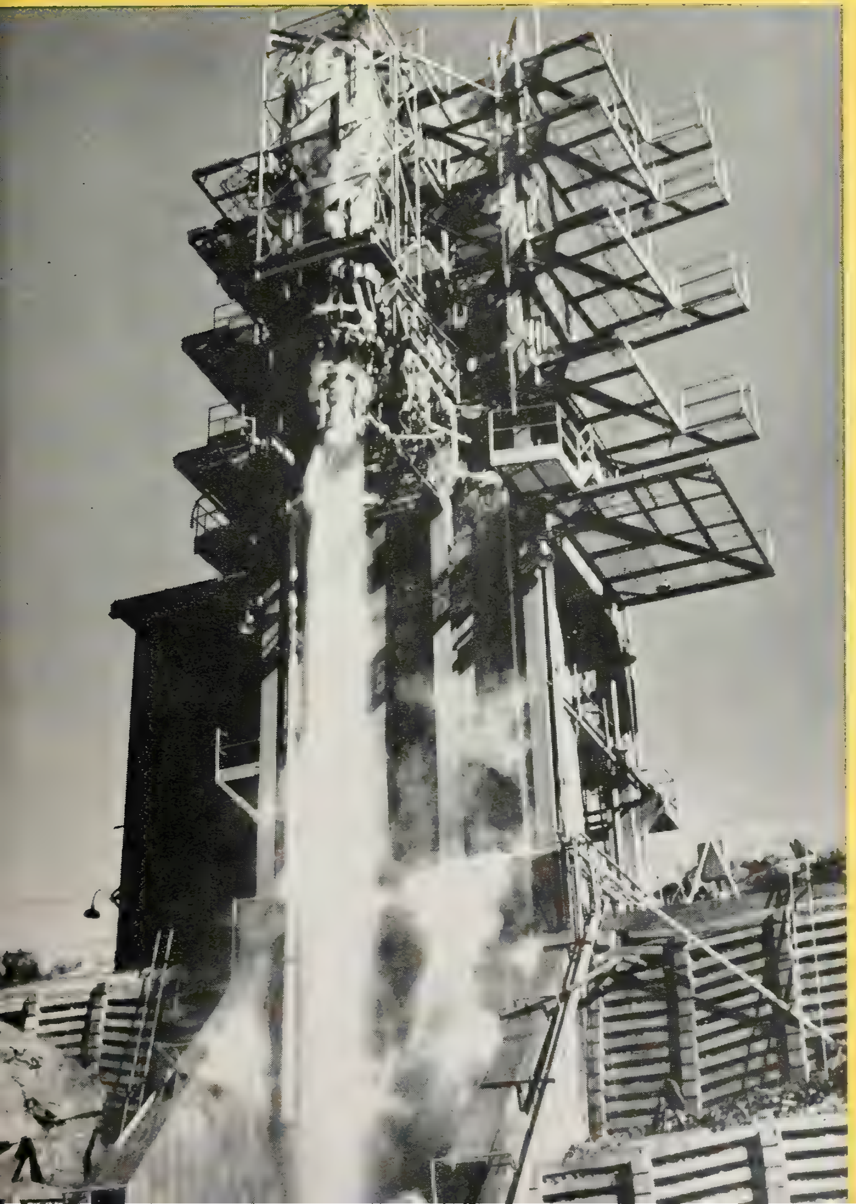

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Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Walbar Machine Products, Inc.

Compressor

Aeroquip Corp.
Aluminum Co. of America
Austenal Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Eaton Mfg. Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Engelhard Industries Inc., D. E. Makepeace Div.
Ex-Cell-O Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Houston Fearless Corp.
Kelsey-Hayes Co.
Kerns Mfg. Corp.
Ladish Co.
La Pointe Industries Inc.
*LYCOMING DIV., AVCO MFG. CORP.
Misco Precision Casting Co.
*STAINLESS PROCESSING DIV., WALL COLMONOY CORP.
*STALKER DEVELOPMENT CO.
Steel Improvement & Forge Co., The
Thompson Products, Inc.
Turbo Products, Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Veet Industries
Walbar Machine Products, Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

Stator

Aeroquip Corp.
Aluminum Co. of America
*AMERICAN MACHINE & FOUNDRY CO.
Austenal Inc.
Eaton Mfg. Co.
Eaton Mfg. Co., Inc., Frederic Flader Div.
Engelhard Industries Inc., D. E. Makepeace Div.
Ex-Cell-O Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Houston Fearless Corp.
Kelsey-Hayes Co.
Kennametal Inc.
Kerns Mfg. Corp.
Ladish Co.
La Pointe Industries Inc.
*LYCOMING DIV., AVCO MFG. CORP.
Marman Div., Aeroquip Corp.
Misco Precision Casting Co.
*STAINLESS PROCESSING DIV., WALL COLMONOY CORP.
*STALKER DEVELOPMENT CO.
Steel Improvement & Forge Co., The
Thompson Products, Inc.
Turbo Products, Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Veet Industries
Walbar Machine Products, Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

Turbine

Aeroquip Corp.
Aluminum Co. of America
*AMERICAN MACHINE & FOUNDRY CO.
Austenal Inc.
Eaton Mfg. Co.
Eaton Mfg. Co., Inc., Frederic Flader Div.
Ex-Cell-O Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haynes Stellite Co., Div.-Union Carbide Corp.
Houston Fearless Corp.
Walter J. Hyatt Co., The
Kelsey-Hayes Co.
Kennametal Inc.
Kerns Mfg. Corp.
Ladish Co.
La Pointe Industries Inc.
*LYCOMING DIV., AVCO MFG. CORP.
Misco Precision Casting Co.
*STAINLESS PROCESSING DIV., WALL COLMONOY CORP.

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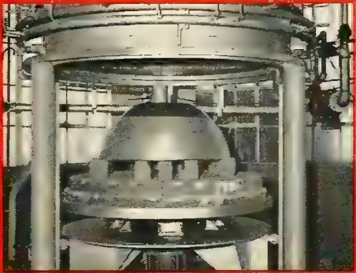

For further information on Lycoming's missile support capabilities, write to: Lycoming, Avco, Stratford, Conn.

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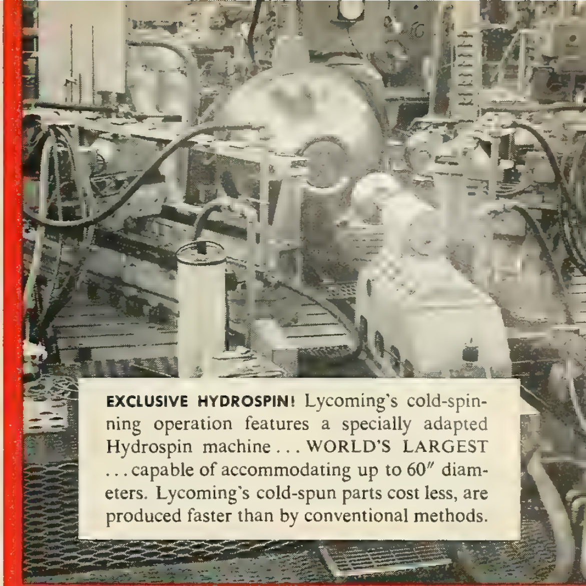

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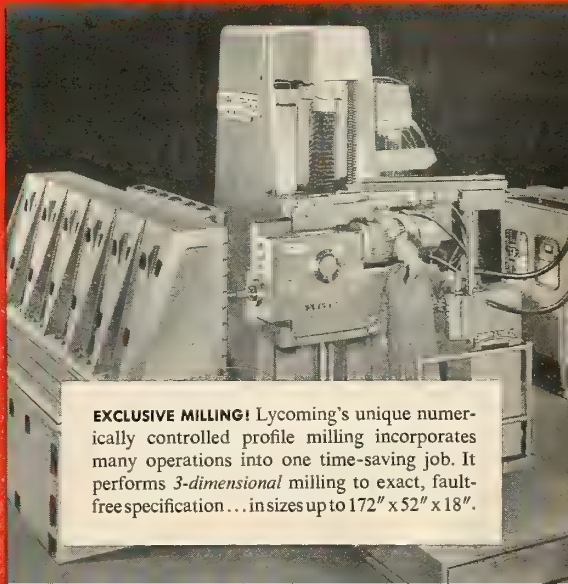

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HMS
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Division of Standard Screw Co.
HARTFORD 2, CONNECTICUT

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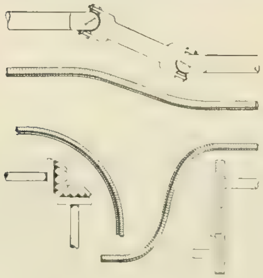

Flexible Shafting reduces the noisy and cumbrous gearing used in conjunction with solid shafts. It has the ability to transfer power from remote places, over, under, and around obstacles found in the path of installation between the drive and the driven units. Flexible Shafting requires very few parts, making them inexpensive; whereas solid shafts using universal joints, miter gears, and gear trains, many times would not be feasible because of their noisiness or lack of economy. With a Flexible Shaft assembly, design may be simplified and your engineering time spent on other necessary component parts without having to worry that they will create obstacles when placed where you want them.

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. . . propulsion system

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Thompson Products, Inc.
Turbo Products, Inc.
United States Chemical Milling Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Veet Industries
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

BLAST DEFLECTOR, PADS AND TUBES

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Continental Diamond Fibre Corp., Sub.-The Budd Co.
***DIVERSEY ENGRG. CO.**
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General Sound Control, Inc.
Globe Industries, Inc.
Hupp Aviation Co.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
Luria Engrg. Co.
McLean Engrg. Laboratories
National Forge & Ordnance Co.
Opelika Welding, Machine & Supply Inc.
Parish Pressed Steel, Div.-Dana Corp.
Portland Cooper & Tank Works Inc.
Ryan Aeronautical Co.
Solar Aircraft Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
H. I. Thompson Fiber Glass Co.
Thompson Products, Inc.

BLOWERS, MOTOR & GENERATOR

Air-Marine Motors, Inc.
American Electronics, Inc.
Blowers Inc.
Dean & Benson Research Inc.
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Hammett Electric Co.
McLean Engrg. Laboratories
Motordyne Inc.
Propulsion Research Corp.
Redmond Co., Inc.
Talley Corp., The
Task Corp.
Telectro Industries Corp.
Thompson Products, Inc.

BLOWERS, SMALL

Air Logistics Corp.
Air-Marine Motors, Inc.
American Electronics, Inc.
Ashland Electric Products, Inc.
Blowers Inc.
Joe Davidson & Associates
Dean & Benson Research Inc.
Electronic Techniques, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Joy Mfg. Co.
Master Appliance Mfg. Co.
J. J. Monaghan Co., Inc.
Motordyne Inc.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Pesco Products Div.-Borg-Warner Corp.
Propulsion Research Corp.
Redmond Co., Inc.
Small Motors Inc.
Stanat Mfg. Co., Inc.
Stratos Div.-Fairchild Engine & Airplane Corp.
Talley Corp., The
Task Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Turbo Products, Inc.
Universal Dynamics Corp.

BOOSTERS, GAS PRESSURE

ACF Industries, Inc., Advanced Products Div.
Accessory Controls & Equipment Corp.
Atlantic Research Corp.
Auto-Control Labs., Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
***GREER HYDRAULICS, INC.**
Haskell Engrg. & Supply Co.
Herrick L. Johnston, Inc.
McCormick Selph Associates
Reaction Motors, Inc.
Sprague Engrg. Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talco Engrg. Co., The
Thompson Products, Inc.
Wells Industries Corp.

BOOSTERS, MISSILE, LIQUID FUELED

ACF Industries, Inc., Advanced Products Div.
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Auto-Control Labs., Inc.
***DIVERSEY ENGRG. CO.**
Hicks Corp., The
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Joclin Mfg. Co.
Kerns Mfg. Corp.
Parish Pressed Steel, Div.-Dana Corp.
Reaction Motors, Inc.
Solar Aircraft Co.
Telectro Industries Corp.
Thompson Products, Inc.
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss-Wright Corp.

BOOSTERS, MISSILE, SOLID FUELED

ACF Industries, Inc., Advanced Products Div.
American Car & Foundry Div., ACF Industries Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Rocket Co.
American Welding & Mfg. Co., The
Anderson, Greenwood & Co.
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
G. W. Galloway Co.
Goodyear Aircraft Corp.
***GRAND CENTRAL ROCKET CO.**
Hicks Corp., The
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Lukens Steel Co.
McCormick Selph Associates
Oerlikon Tool & Arms Corp. of America
Parish Pressed Steel, Div.-Dana Corp.
Propellex Chemical Corp.
Redstone Arsenal Research Div., Rohm & Haas Co.
Solar Aircraft Co.
Talco Engrg. Co., The
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Turbo Dynamics Corp.
Wheland Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

BORON

American Potash & Chemical Corp., National Northern Div.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Turbo Dynamics Corp.

BRASS

American Brake Shoe Co.
American Brass Co., The
American Silver Co.
Anchor Metal Co. Inc.
Bearium Metals Corp.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Chase Brass & Copper Co., Inc.
Dumont Aircraft Fitting Co.
National Copper & Smelting Co.
Revere Copper & Brass Inc.
Springfield Brass Co.
Titan Metal Mfg. Co.

BRAZING ALLOYS

***STAINLESS PROCESSING DIV., WALL COLMONOY CORP.**

BREATHERS, ENGINE

Wright Aeronautical Div., Curtiss Wright Corp.

BRONZE

American Brake Shoe Co.
American Brass Co., The
American Non Gran Bronze Co.
American Silver Co.
Ampco Metal, Inc.
Bearium Metals Corp.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Chase Brass & Copper Co., Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
True Alloys Inc.
Revere Copper & Brass Inc.
Springfield Brass Co.
Titan Metal Mfg. Co.

BRONZE, PHOSPHOR

American Brake Shoe Co.
American Brass Co., The
American Silver Co.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Chase Brass & Copper Co., Inc.
Fromson Orban Co., Inc.
True Alloys Inc.
Revere Copper & Brass Inc.
Springfield Brass Co.

BUSHINGS, HERMETICALLY SEALED

B G Corp., The
Ceramaseal, Inc.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Garde Mfg. Co.
General Cable Corp.
Heldor Mfg. Co., Inc.
Lundy Associates Inc.
Telectro Industries Corp.
Weatherhead Co., The

BUSHINGS, METALLIC

Ace Drill Bushing Co. Inc.
Acme Industrial Co.
Aerolite Electronics Corp.
American Brake Shoe Co.
American Brass Co., The
American Non Gran Bronze Co.
American Standard Products, Inc.
American Steel Foundries, Hammond Div.
Ampco Metal, Inc.
Atlas Brass Foundry
Bearium Metals Corp.
Bergen Carbide Co.
J. H. Bunnell & Co.
Carbone Corp., The
Century Fasteners Corp.
Corbin Products Div.
R. C. Dudek & Co.
Elastic Stop Nut Corp. of America
Electronic Techniques, Inc.
Ex-Cell-O Corp.
Federal Machine Co. Inc.
Federal Screw Products Inc.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kemp Inc.
R. I. Metpro, Inc.
Henry & Miller Industries, Inc.
Parker Aircraft Co.
Peerless Products Industries
Progressive Research & Development Co., Inc.
True Alloys Inc.
Randall Graphite Bearings, Inc.
Rattan Mfg. Co., The
Research Development Mfg. Inc.
St. Marys Carbon Co.
Seamless Products Co., Inc.
Sinclair Mfg. Co.
Skinner Precision Products
Southwest Products Co.
Springfield Brass Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Technical Oil Tool Corp.
Wrought Washer Mfg. Co.

BUSHINGS, NON METALLIC

Aerolite Electronics Corp.
Allied Plastics Supply Corp.
American Brake Shoe Co.
Auburn Mfg. Co., The
Bergen Carbide Co.
Birnbach Radio Co., Inc.
Chicago Gasket Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
Dixon Corp
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
Fluorocarbon Co. Inc., The
Graphie Metallizing Corp.
Isolantite Mfg. Corp.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Jodee Plastics Co.
Kemp Inc.
Walter Lee Chemical Corp.
J. A. Maurer, Inc.
Morganite, Inc.
Ohio Carbon Co., The
Peerless Products Industries
Progressive Research & Development Co., Inc.
Rattan Mfg. Co., The
Rubbercraft Corp. of California
St. Marys Carbon Co.
Silicone Insulation, Inc.
Sinclair Mfg. Co.
Southwest Products Co.
Synthane Corp.
Topper Mfg. Co., Inc.
Truxton Industries, Inc.
Waterbury Companies, Inc.
Wrought Washer Mfg. Co.

CABLE, IGNITION

Aerolite Electronics Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
American Electric Cable Co.
Beaton & Corbin Mfg. Co., The
Belden Mfg. Co.
Berkshire Electric Cable Co.
General Cable Corp.
Hallett Mfg. Co.

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ALL-WELDED
V-28100
Series
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VALCOR
SOLENOID VALVE

...the only all-metal, in-line solenoid valve with an optically-flat seat!

The all-new Valcor V-28100 Solenoid Valve eliminates all internal or external non-metal seals. All-welded, all-metal, the V-28100 is designed to minimize temperature and media problems for the long life of the valve. The V-28100 features an optically-flat, hard-faced seating, one of the many unusual engineering designs responsible for Valcor's wide acceptance throughout industry. And because of its all-metal construction, the shelf life of the V-28100 is unlimited.

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MEDIA: Fuels, hydraulics, pneumatics, liquid gases
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DIMENSIONS: 1.25" x 2.60"
RESPONSE: 15 milliseconds
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VALCOR ENGINEERING CORP.
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. . . propulsion system

Hammett Electric Co.
International Electric Industries, Inc.
Jefferson Products Corp.
Kilgen Aircraft Div.-The Kilgen Organ Co.
Mohawk Wire & Cable Corp.
Okonite Co., The
Packard Electric Div.-General Motors Corp.
Rex Corp. The
Scintilla Div., Bendix Aviation Corp.
Skytronics
Surprenant Mfg. Co.
Telectro Industries Corp.
Titeflex, Inc.
Western International Co.
Winder Aircraft Corp. of Fla.

CADMIUM

Accurate Specialties Co., Inc.
American Silver Co.
Anchor Metal Co., Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Division Lead Co.
Eagle-Picher Co., The
Harmon, Lichtenstein & Co.

CALCIUM

Barium & Chemicals, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.

CAPS, TUBE

Aerolite Electronics Corp.
Alden Products Co.
American Brass Co., The
Clover Industries, Inc.
Electron Products, Inc.
Hobson Brothers, Inc.
R. I. Metpro, Inc.
Pacific Cut Washer Co.
Ray A. Scharer & Co.
Spincraft, Inc.

CARBIDES

Bergen Carbide Co.
Bram Metallurgical & Chemical Co.
Carbone Corp., The
Firth Sterling Inc.
Kennametal Inc.
Metallurgical Products Dept., General Electric Co.
Norton Co.

CARBON

Carbone Corp., The
Erie Resistor Corp.
Morganite, Inc.
Ohio Carbon Co., The
Pure Carbon Co., Inc.
St. Marys Carbon Co.
Superior Carbon Products, Inc.
United Carbon Products Co.

CASTINGS

Alloy Precision Castings Co.
Ampco Metal, Inc.
Belmont Smelting & Refining Works, Inc.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Haynes Stellite Co., Div.-Union Carbide Corp.
Hitchiner Mfg. Co., Inc.
Kemp Inc.
Lebanon Steel Foundry
Misco Precision Casting Co.
New York Air Brake Co., The, Watertown Div.
Thompson Products, Inc.
United Mfg. Co., The

Centrifugal, Ferrous

American Brake Shoe Co.
Anchor Metal Co., Inc.
Crucible Steel Co. of America
Dale Products, Inc.
Electric Steel Foundry Co.
Kemp Inc
Lebanon Steel Foundry
Misco Precision Casting Co.
Perfecto Cast
Ray A. Scharer & Co.
Shenango Furnace Co., The, Centrifugally Cast Products Div.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.

Centrifugal, Non Ferrous

Aluminum Co. of America
American Brake Shoe Co.
American Non Gran Bronze Co.
Ampco Metal, Inc.
Bendix Foundries, Bendix Aviation Corp.
Celco-Constantine Engrg. Laboratories Co.
Dale Products, Inc.
Kemp -Inc.
New York Air Brake Co., The, Watertown Div.
Precision Castings, Inc.
True Alloys, Inc.
Randall Graphite Bearings, Inc.
Ray A. Scharer & Co.
Shenango Furnace Co., The, Centrifugally Cast Products Div.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.

Die, Ferrous

American Car & Foundry Div., ACF Industries, Inc.
Dale Products, Inc.
Stewart-Warner Corp.

Die, Non Ferrous

Aluminum Co. of America
Anchor Metal Co., Inc.
Belmont Smelting & Refining Works, Inc.
Bendix Foundries, Bendix Aviation Corp.
Dale Products, Inc.
Electric Auto-Lite Co., The
Hampden Brass & Aluminum Co.
P. R. Mallory & Co., Inc.
Sel-Rex Corp.
Stewart-Warner Corp.
Titan Metal Mfg. Co.
Veet Industries

Precision, Ferrous

Alloy Precision Castings Co.
American Brake Shoe Co.
American Brake Shoe Co., Engineered Casting Div
American Car & Foundry Div., ACF Industries, Inc.
Arwood Precision Casting Corp.
Austenal Inc.
Crucible Steel Co. of America
Dale Products, Inc.
Eaton Mfg. Co.
Haynes Stellite Co., Div.-Union Carbide Corp.
Hitchiner Mfg. Co., Inc.
Indiana Foundry
Investment Casting Co.
Lebanon Steel Foundry
Mercast Mfg. Corp.
Misco Precision Casting Co.
New York Air Brake Co., The, Watertown Div.
Pacific Alloy Engrg. Corp.
Perfecto Cast
Thompson Products, Inc.
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.
***WESTINGHOUSE ELECTRIC CORP.**

Precision, Non Ferrous

Alloy Precision Castings Co.
Aluminum Alloys Corp.
Aluminum Co. of America
American Brake Shoe Co.
Anchor Metal Co., Inc.
Arwood Precision Casting Corp.
Austenal Inc.
Morris Bean & Co.
Bendix Foundries, Bendix Aviation Corp.
Dale Products, Inc.
Fischer & Porter Co.
Haynes Stellite Co., Div.-Union Carbide Corp.
Hills-McCanna Co.
Hitchiner Mfg. Co., Inc.
Indiana Foundry
Investment Casting Co.
Kemp, Inc.
Light Metals, Inc.
P. R. Mallory & Co., Inc.
Mercast Mfg. Corp.
New York Air Brake Co., The, Watertown Div.
Ohio Precision Castings, Inc.
Precision Castings, Inc.
Sel-Rex Corp.
Solon Foundry, Inc.
Thompson Products, Inc.
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

CEMENT, ASBESTOS

Anchor Packing Co., The
Dennis Chemical Co.
Eagle-Picher Co., The
Rubber & Asbestos Corp.
Sauereisen Cements Co.
Union Asbestos & Rubber Co.
United Shoe Machinery Corp.
Zophar Mills Inc.

CEMENT, PIPE-JOINT

Anchor Packing Co., The
Barium & Chemicals, Inc.
Bios Labs., Inc.
Eco Engrg. Co.
Hastings Plastics Inc.
Johns-Mansville Dutch Brand Div.
Parker-Hannifin Corp.
Rubber & Asbestos Corp.
Sauereisen Cements Co.
Smooth-On Mfg. Co.
X-Pando Corp.
Zophar Mills Inc.

CEMENT, RUBBER

Anchor Packing Co., The
Avondale Co., The
Bios Labs., Inc.
Connecticut Hard Rubber Co., The
Continental Rubber Works
***COOPER DEVELOPMENT CORP.**
General Cement Mfg. Co., Div.-Textron Inc.
B. F. Goodrich Industrial Products Co.
Johns-Mansville Dutch Brand Div.
Lebec Chemical Corp.
Rubber & Asbestos Corp.
Rubbercraft Corp. of California
United Shoe Machinery Corp.

CERAMIC PARTS

American Lava Corp.
Auburn Spark Plug Co., Inc.
Bendix Products Div., Bendix Aviation Corp.
Bergen Carbide Co.
California Aircraft Products
Corning Glass Works
Diamonite Products Mfg. Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Erie Resistor Corp.
General Ceramics Corp.
General Instrument Corp., Defense Products Div.
Goe Engrg. Co.
Heldor Mfg. Co., Inc.
Walter J. Hyatt Co., The
Isolantite Mfg. Corp.
Lapp Insulator Co., Inc., Radio Specialties Div.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Chester Morton Electronics Corp.
Mycalex Corp. of America
National Ceramic Co.
Norton Co.
Patterson Foundry & Machine Co., The
Rogers Corp.
Saxonburg Ceramics
Size Control Co.
D. M. Steward Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Thermo Materials, Inc.
Turbo Dynamics Corp.
Western Gold & Platinum
Zirconium Corp. of America

CERAMICS, HIGH TEMPERATURE

American Lava Corp.
Auburn Spark Plug Co., Inc.
Barium & Chemicals, Inc.
Bendix Products Div., Bendix Aviation Corp.
Brush Beryllium Co., The
Corning Glass Works
Diamonite Products Mfg. Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Erie Resistor Corp.
General Ceramics Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Isolantite Mfg. Corp.
Lapp Insulator Co., Radio Specialties Div.
Linde Co., Div.—Union Carbide
Litton Industries, Components Div.
Luria Engrg. Co.
Marquardt Aircraft Co.
Maryland Lava Co.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
Norton Co.
Rogers Corp.
Saxonburg Ceramics
Solar Aircraft Co.
D. M. Steward Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Thermo Materials, Inc.
Topper Mfg. Co., Inc.
Turbo Dynamics Corp.
Western Gold & Platinum
Zirconium Corp. of America

CHAIN, SMALL DRIVE

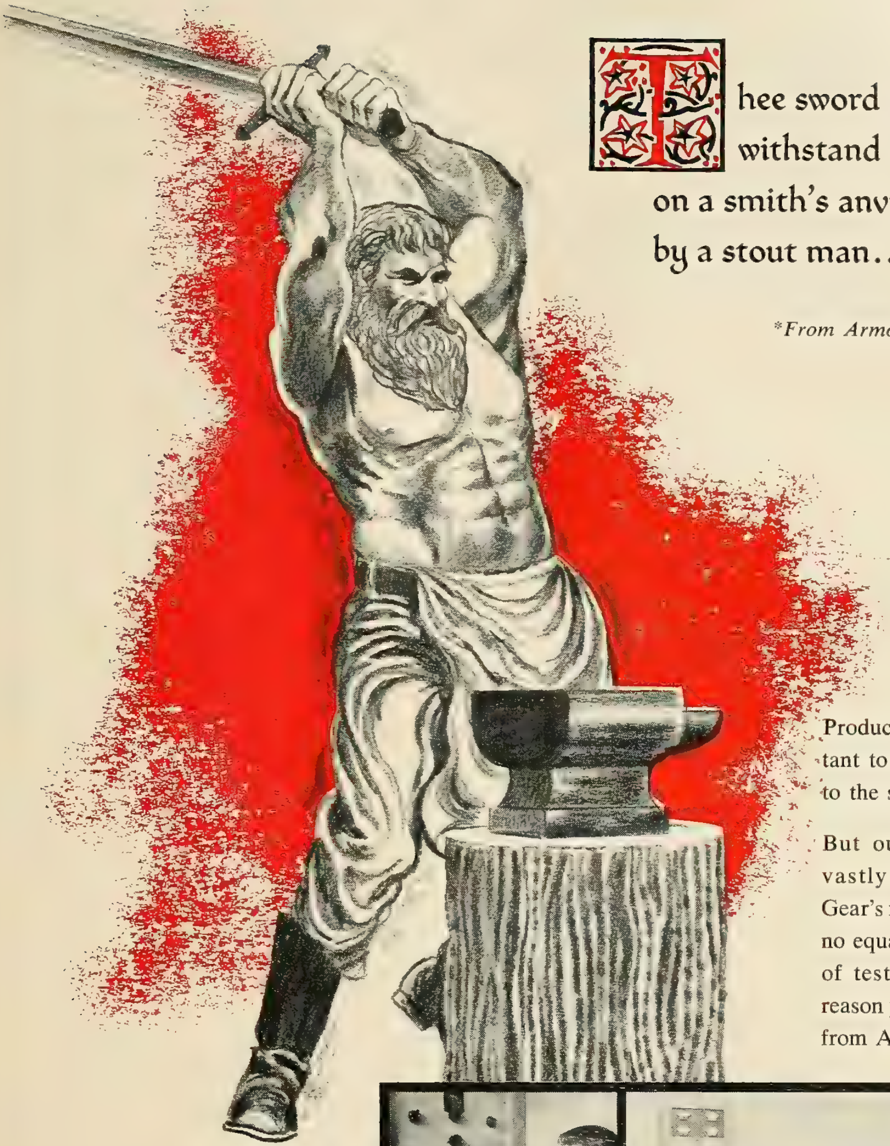
Chain Belt Co.

CHEMICALS, RADIOACTIVE

Bios Labs., Inc.
Canadian Radium & Uranium Corp.
United States Radium Corp.

CHROMIUM

Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Marman Div., Aeroquip Corp.

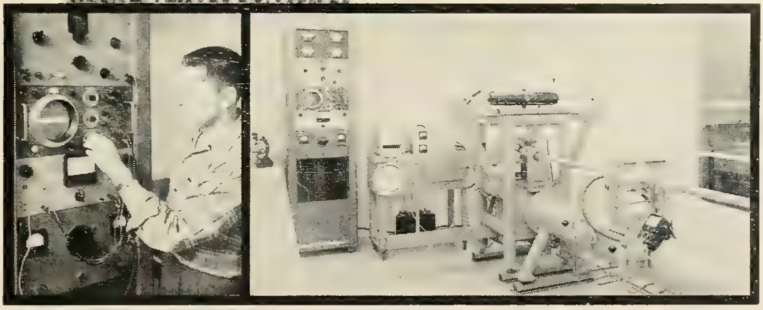


Thee sword must
withstand a solid blow
on a smith's anville
by a stout man...*

*From Armourer's specifications, 1450.

Product testing is just as important to Advance Gear as it was to the swordsmith of old...

But our testing methods are vastly changed . . . Advance Gear's new testing laboratory has no equal in equipment or scope of testing technique, another reason you can expect perfection from Advance Gear.



A section of Advance Gear's testing laboratory. Gear systems for the Bomarc missile are tested here before delivery to Boeing.

WRITE FOR FREE ADVANCE GEAR FACILITIES BROCHURE

AG

ADVANCE GEAR AND MACHINE CORP.
5851 HOLMES AVE. • LOS ANGELES 1, CALIFORNIA

CLAMPS, HOSE

Aeroquip Corp.
Avica Corp.
California Aircraft Products
Continental Rubber Works
Devilbiss Co., The
Dumont Aviation Associates
Dumont Aircraft Fitting Co.
Eaton Mfg. Co.
Hammett Electric Co.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
National Utilities Corp.
Progressive Research & Development Co., Inc.
M. L. Snyder & Son, Inc.
Specialty Products Corp.
Titeflex, Inc.
Turbo Products, Inc.
United Supply Co.
United-Carr Fastener Corp.
Universal Metal Products Inc.

CLAMPS, MECHANICAL CABLE

Aerolite Electronics Corp.
Burndy Corp., Omaton Div.
Carroll Pressed Metal, Inc.
Dakota Engrg., Inc.
Hammett Electric Co.
Holub Industries, Inc.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Kickhaefer Mfg. Co.
Kulka Electric Corp.
Progressive Research & Development Co., Inc.
TA Mfg. Corp.
Titeflex, Inc.
Turbo Products, Inc.

CLAMPS, SPECIAL

Abalon Precision Mfg. Corp.
Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Aeroquip Corp.
American Welding & Mfg. Co., The
Basic Tool Industries, Inc.
Birnbach Radio Co., Inc.
California Aircraft Products
Carroll Pressed Metal, Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
D. S. D. Mfg. Co., The
Dakota Engrg., Inc.
Dumont Aircraft Fitting Co.
G. M. Dykes Iron Works, Inc.
Federal Machine Co. Inc.
Walter J. Hyatt Co., The
***JANITROL AIRCRAFT DIV.—SURFACE COMBUSTION CORP.**
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Kickhaefer Mfg. Co.
Marman Div., Aeroquip Corp.
Henry & Miller Industries, Inc.
National Utilities Corp.
Progressvie Research & Development Co., Inc.
Ryan Aeronautical Co.
Sinclair Mfg. Co.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Peerless Electronics Inc.
Specialty Products Corp.
Stewart-Warner Corp.
TA Mfg. Corp.
Titeflex, Inc.
Turbo Products, Inc.
United Mfg. Co., The
Universal Metal Products Inc.
Wollam Aircraft & Marine Products Co.

CLAMPS, TUBE

Aeroquip Corp.
Alden Products Co.
Avica Corp.
Birnbach Radio Co., Inc.
Branson Instruments, Inc.
Carroll Pressed Metal, Inc.
Cobehn, Inc.
D. S. D. Mfg. Co., The
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Gasket, Packing & Specialty Co. Inc.
Walter J. Hyatt Co., The
***JANITROL AIRCRAFT DIV.—SURFACE COMBUSTION CORP.**
Walter K. Jaros, Aircrafters
Kickhaefer Mfg. Co.
Kolton Electric Mfg. Co.
Marman Div., Aeroquip Corp.
Narda Microwave Corp., The
Peerless Electronics Inc.
Progressive Research & Development Co., Inc.
Shaw Metal Products Corp.
TA Mfg. Corp.
Titeflex, Inc.
Turbo Products, Inc.
Universal Metal Products Inc.
Vemaline Products Co.

CLEANERS, ULTRASONIC

Alcar Instruments, Inc.
Blackstone Corp.
Gerard G. Leeds Co., Inc.
John B. Moore Corp.
Penetone Co., The
Science House, Inc.
Turco Products, Inc.
Wye Industries

CLIPS, TUBE

Aerolite Electronics Corp.
American Brass Co., The
Atlas E-E Corp.
Avica Corp.
H. Braun Tool & Instrument Co., Inc.
Dumont Aviation Associates
Hobson Brothers, Inc.
Walter K. Jaros, Aircrafters
Kickhaefer Mfg. Co.
Kolton Electric Mfg. Co.
Parker-Hannifin Corp.
Reliable Spring & Wire Forms Co., The
TA Mfg. Corp.
Universal Metal Products Inc.

CLOTH, GLASS

Aero Leather Products Co.
Allied Plastics Supply Corp.
Atlas Asbestos Co.
Bar-Ray Products, Inc.
Cordo Molding Products, Inc.
C. R. Daniels, Inc.
Duracote Corp.

CLUTCHES, MAGNETIC

American Flexible Coupling Div., Zurn Industries, Inc.
Bogue Electric Mfg. Co.
Cutler-Hammer Inc.
Joe Davidson & Associates
Dial Products Co.
***FLIGHT RESEARCH, INC.**
Geartronics Corp.
Lyndon Aircraft, Inc.
J. A. Maurer, Inc.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
Wacline, Inc.
Waveguide, Inc.

CLUTCHES, MOTOR & GENERATOR

American Flexible Coupling Div., Zurn Industries, Inc.
Bogue Electric Mfg. Co.
Digitronics Corp.
General Railway Signal Co.
Graphite Metallizing Corp.
Hammett Electric Co.
La Pointe Industries Inc.
Overload Control Co.
Servomechanisms, Inc., Mechatrol Div.
Varo Mfg. Co.
Wacline, Inc.

COATINGS, CONDUCTIVE-TUBE INTERIOR

Amercoat Corp.
Carbone Corp., The
B. F. Goodrich Industrial Products Co.
Merix Chemical Co.
Silicones Div.-Union Carbide Corp.

COATINGS, HIGH TEMPERATURE

Amercoat Corp.
American Cord & Webbing Co., Inc.
American Rocket Co.
Atlantic Research Corp.
Avondale Co., The
Barium & Chemicals, Inc.
Carl Biggs Co.
Bios Labs., Inc.
Carbone Corp., The
Connecticut Hard Rubber Co., The
Consolidated Electrodynamics Corp.
***COOPER DEVELOPMENT CORP.**
Drilube Co.
Duracote Corp.
Eagle-Picher Co., The
Electrofilm, Inc.
Emerson & Cuming, Inc.
General Cement Mfg. Co., Div.-Textron Inc.
General Plastics Corp. of New Jersey
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Joclin Mfg. Co.
Kemp Inc.
Linde Co., Div.-Union Carbide
Marquardt Aircraft Co.
Norton Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Sel-Rex Corp.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Sparta Mfg. Co.
Arthur Tickle Engrg. Works, Inc.
Topper Mfg. Co., Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Zirconium Corp. of America

COATINGS, SPECIAL PURPOSE

Amercoat Corp.
American Cord & Webbing Co., Inc.
American Rocket Co.
Atlantic Research Corp.
Avondale Co., The
***BAUSCH & LOMB OPTICAL CO.**
Carl Biggs Co.
Bios Labs, Inc.
Canadian Radium & Uranium Corp.
Carbone Corp., The
Connecticut Hard Rubber Co., The
Dennis Chemical Co.
Drilube Co.
Duracote Corp.
Electrofilm, Inc.
Elektro-Serv Co.
General Plastics Corp. of New Jersey
B. F. Goodrich Industrial Products Co.
Hastings Plastics Inc.
Horsey, Robson & Co., Inc.
***IDEAL CHEMICAL PRODUCTS, INC.**
Joclin Mfg. Co.
Linde Co., Div.-Union Carbide
Midland Paint & Varnish Co., The
New England Tape Co. Inc.
Norton Co.
Olin -Mathieson Chemical Corp., High Energy Fuels Div.
Sel-Rex Corp.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Sparta Mfg. Co.
Arthur Tickle Engrg. Works, Inc.
Topper Mfg. Co., Inc.
United Shoe Machinery Corp.
Vorac Co., The

COILS, HIGH TEMPERATURE

Advanced Electronics, Inc.
Aerolite Electronics Corp.
Associated American Winding Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Garde Mfg. Co.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Mar Vista Engrg. Co.
J. W. Miller Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
New York Coil Co., Inc.
Potter Aeronautical Corp.
Precision, Inc.
Scintilla Div., Bendix Aviation Corp.
Sealectric Switch & Relay Corp.
Tele-Coil Co.
Telectro Industries Corp.
Tri-Dex Co.
Tur-Bo Jet Products Co., Inc.

COILS, IGNITION

Associated American Winding Co., Inc.
***COOPER DEVELOPMENT CORP.**
Electric Auto-Lite Co., The
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Hammett Electric Co.
New York Coil Co., Inc.
Scintilla Div., Bendix Aviation Corp.
Tele-Coil Co.
Telectro Industries Corp.
Titeflex, Inc.

COMBUSTION CHAMBER COVERS

ACF Industries, Inc., Advanced Products Div.
Bridgwater Machine Co.
Christie Machine Works
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hicks Corp., The
Hupp Aviation Co.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
***LYCOMING DIV., AVCO MFG. CORP.**
***PHOENIX PRODUCTS CO.**
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
Turbo Dynamics Corp.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div. Curtiss-Wright Corp.

COMBUSTION CHAMBER LINERS

ACF Industries, Inc., Advanced Products Div.
Bridgwater Machine Co.
California Aircraft Products
Continental Diamond Fibre Corp., Sub.-The Budd Co.
*COOPER DEVELOPMENT CORP.
Corning Glass Works
Cuno Engrg. Corp., The
*DIVERSEY ENGRG. CO.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hicks Corp., The
Hupp Aviation Co.
*IDEAL CHEMICAL PRODUCTS, INC.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
*LAVELLE AIRCRAFT CORP.
*LYCOMING DIV., AVCO MFG. CORP.
Marquardt Aircraft Co.
Norton Co.
*PHOENIX PRODUCTS CO.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
H. I. Thompson Fiber Glass Co.
Thompson Products, Inc.
*C. W. TORNGREN CO., INC.
Turbo Dynamics Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

COMBUSTION CHAMBERS

ACF Industries, Inc., Advanced Products Div.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Welding & Mfg. Co., The
Atlantic Research Corp.
Bridgwater Machine Co.
Christie Machine Works
Corning Glass Works
*DIVERSEY ENGRG. CO.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Hicks Corp., The
Hupp Aviation Co.
Kelsey-Hayes Co.
*LAVELLE AIRCRAFT CORP.
*LYCOMING DIV., AVCO MFG. CORP.
Marquardt Aircraft Co.
Menasco Mfg. Co.
Oerlikon Tool & Arms Corp. of America
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works Inc.
Propellex Chemical Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
H. I. Thompson Fiber Glass Co.
Thompson Products, Inc.
*C. W. TORNGREN CO., INC.
Turbo Dynamics Corp.
United Mfg. Co., The
Veet Industries
Warren Mfg. Div., Warren Brothers Roads Co.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

COMBUSTORS

Eaton Mfg. Co., Inc., Fredric Flader Div.
Hupp Aviation Co.
Marquardt Aircraft Co.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Solar Aircraft Co.
Thompson Products, Inc.
Turbo Dynamics Corp.
Westinghouse Electric Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

COMPRESSOR ASSEMBLIES

Air Logistics Corp.
*AMERICAN MACHINE & FOUNDRY CO.
American Welding & Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
Bridgwater Machine Co.
Champion Pneumatic Machinery Co.
*EASTERN INDUSTRIES, INC.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Ex-Cell-O Corp.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Haskell Engrg. & Supply Co.
Kelsey-Hayes Co.
Walter Kidde & Co., Inc., Aviation Div.
*LYCOMING DIV., AVCO MFG. CORP.
Solar Aircraft Co.
Thompson Products, Inc.
Turbo Products, Inc.
Veet Industries
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

COMPRESSOR ASSEMBLIES, AXIAL FLOW

American Welding & Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
Bridgwater Machine Co.
Champion Pneumatic Machinery Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Ex-Cell-O Corp.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Kelsey-Hayes Co.
Kerns Mfg. Corp.
*LYCOMING DIV., AVCO MFG. CORP.
Misco Precision Casting Co.
Solar Aircraft Co.
Thompson Products, Inc.
Turbo Products, Inc.
Veet Industries
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

COMPRESSOR ASSEMBLIES, CENTRIFUGAL FLOW

American Welding & Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
Bridgwater Machine Co.
Champion Pneumatic Machinery Co.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Kelsey-Hayes Co.
Kerns Mfg. Corp.
*LYCOMING DIV., AVCO MFG. CORP.
Misco Precision Casting Co.
Solar Aircraft Co.
Thompson Products, Inc.
Turbo Products, Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

COMPRESSORS, GAS

Accessory Controls & Equipment Corp.
Bridgwater Machine Co.
Cardox Corp.
Carrier Corp.
Champion Pneumatic Machinery Co.
*CORNELIUS CO., THE
Eaton Mfg. Co., Inc., Fredric Flader Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
Kerns Mfg. Corp.
Solar Aircraft Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.

CONDUITS, FIBER

Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Flexaust Co., The
General Plastics Corp. of New Jersey
Hastings Plastics Inc.
Lamtex Industries, Inc
Penn Fibre & Speciality Co., Inc.
Rogers Corp.
Saylor Electric Products Corp.
Zippertubing Co., The

CONDUITS, IGNITION WIRE

Co-operative Industries, Inc.
Flexible Metal Hose Mfg. Co.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
Marco Industries Co.
J. E. Menaugh Co.
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Skytronics
Titeflex, Inc.
Westwood Cable Corp.
Zippertubing Co., The

CONDUITS, METAL, FLEXIBLE

American Brass Co., The
American Brass Co., American Metal Hose Div.
Arens Controls, Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Co-operative Industries, Inc.
D K Mfg. Co.
Federal Metal Hose Corp.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
Rodney Metal Inc.
Servicair Co.
Skytronics
Titeflex, Inc.
Westwood Cable Corp.
Zippertubing Co., The

CONDUITS, METAL, NON-FLEXIBLE

Aluminum Co. of America
American Brass Co., The
*AMERICAN TUBE BENDING CO., INC.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
D K Mfg. Co.
General Cable Corp.
Hallett Mfg. Co.
Huber Industries, Inc.
Titeflex, Inc.
Woolf Aircraft Products, Inc.

CONES, EXHAUST

American Welding & Mfg. Co., The
Associated Co., Inc.
Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
*COOPER DEVELOPMENT CORP.
*DIVERSEY ENGRG. CO.
G. M. Dykes Iron Works, Inc.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Foote Brothers Gear & Machine Corp.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
*LAVELLE AIRCRAFT CORP.
Lukens Steel Co.
*LYCOMING DIV., AVCO MFG. CORP.
Marquardt Aircraft Co.
Parish Pressed Steel, Div.-Dana Corp.
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Quick Charge Corp.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
Size Control Co.
Smith-Morris Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
*C. W. TORNGREN CO., INC.
Turbo Dynamics Corp.
Turbo Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Veet Industries
Warren Mfg. Div., Warren Brothers Roads Co.
*WESTINGHOUSE ELECTRIC CORP.
Wheland Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

CONNECTORS, ELECTRIC FIREWALL

Airwork Corp.
*ANTON ELECTRONIC LABS., INC.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avnet Corp.
Cannon Electric Co.
Coaxial Connectors Co. Inc.
Dumont Aircraft Fitting Co.
R. C. Dudek & Co.
Garde Mfg. Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General R-F Fittings, Inc.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.
Titeflex, Inc.
Winchester Electronics, Inc.

CONNECTORS, PRESSURIZED

Airwork Corp.
*ANTON ELECTRONIC LABS., INC.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avnet Corp.
Burndy Corp., Omaton Div.
Cannon Electric Co.
Coaxial Connector Co. Inc.
Garde Mfg. Co.
General R-F Fittings, Inc.
Joclin Mfg. Co.
Mendelsohn Speedgun Co., Inc.
*HAROLD H. POWELL CO.
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.
U. S. Component Inc.
Uniwave, Inc.
Western International Co.
Winchester Eelctronics, Inc.

CONTROLS

Aero Supply Mfg. Co., Inc.
Airborne Accessories Corp.
Automatic Switch Co.
Barton Instrument Corp.
Bendix Products Div., Bendix Aviation Corp.
Bogue Electric Mfg. Co.
Briggs Associates, Inc.
CDC Control Services, Inc.
Clark Electronic Laboratories
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
General Controls Co.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hallamore Electronics Co.

. . . propulsion system

***A. W. HAYDON CO., THE**
Industrial Instruments Inc.
***KAHN & CO., INC.**
Lear, Inc.
Leeds & Northrup Co.
Patterson, Moos Div.-Universal Winding Co., Inc.
Reaction Motors, Inc.
Milton Roy Co.
Ryan Aeronautical Co.
Scientific Instrument Co.
Servomechanisms Inc.
Vickers Inc., Div.-Sperry Rand

Chemical

American Rocket Co.
Barton Instrument Corp.
CDC Control Services, Inc.
Devco Engrg. Inc.
General Cement Mfg. Co., Div.-Textron Inc.
Merix Chemical Co.
Process & Instruments
Research Controls
Milton Roy Co.
Thompson Products, Inc.
Turbo Dynamics Corp.

Combustion

CDC Control Services, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Electronics Corp. of America
Hagan Chemicals & Controls, Inc.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Leeds & Northrup Co.
Marquardt Aircraft Co.
National Airoil Burner Co.
Servomechanisms, Inc.
Telectro Industries Corp.
Thompson Products, Inc.
Turbo Dynamics Corp.
Whittaker Controls, Div.-Telecomputing Corp.

Density

CDC Control Services, Inc.
W. C. Dillon & Co., Inc.
Electronic Control Corp.
Hallamore Electronics Co.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Potter Aeronautical Corp.
Telectro Industries Corp.

Dynamometer

Bogue Electric Mfg. Co.
CDC Control Services, Inc.
Electric Auto-Lite Co., The
General Electric Co., Apparatus Sales Div
Hallamore Electronics Co.
Lear, Inc.
Scientific Instrument Co.
Systron Corp.
Telectro Industries Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Engine

American Electronics, Inc., Data-Tronics Div.
Associated Co., Inc.
Autonetics, Div.-North American Aviation, Inc.
CDC Control Services, Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Consolidated Controls Corp.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Hallamore Electronics Co.
Walter J. Hyatt Co., The
Koehler Aircraft Products Co., Inc.
Lear, Inc.
Marquardt Aircraft Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Reaction Motors, Inc.
Reid Metal Products, Inc.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Solar Aircraft Co.
Southwest Products Co.
Telectro Industries Corp.
Teleflex Inc.
Trimount Instrument Co.
Vickers Inc., Div.-Sperry Rand
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Western Arc Welding, Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Fire

Abrams Instrument Corp.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
CDC Control Services, Inc.
Cardinal Instrumentation Corp.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engelberg Huller Co., Inc.
T-C Div., Dyna-Empire, Inc.
Telectro Industries Corp.
Whittaker Controls, Div.-Telecomputing Corp.

Flame Failure

Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Briggs Associates, Inc.
CDC Control Services, Inc.
Electronics Corp. of America
Ess Instrument Co.
General Controls Co.
National Airoil Burner Co.
T-C Div., Dyna-Empire, Inc.
Telectro Industries Corp.
Whittaker Controls, Div.—Telecomputing Corp.

Fluid Conductivity

CDC Control Services, Inc.
Ess Instrument Co.
Hydra-Power Corp.
Industrial Instruments Inc.
Koehler Aircraft Products Co., Inc.
Leeds & Northrup Co.
Merix Chemical Co.
Minneapolis-Honeywell Regulator Co., Aeornautical Div.
Systron Corp.

Fluid Flow

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Alco Valve Co.
American Electronics Inc.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Automatic Switch Co.
Barton Instrument Corp.
Briggs Associates, Inc.
CDC Control Services, Inc.
Cadillac Gage Co.
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
Dynametrics Corp.
Dynamic Controls Corp.
***EASTERN INDUSTRIES, INC.**
General Controls Co.
***GREER HYDRAULICS, INC.**
Gulton Industries, Inc.
Hagan Chemicals & Controls, Inc.
Hallamore Electronics Co.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Kelsey-Hayes Co.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Leeds & Northrup Co.
***WALLACE O. LEONARD, INC.**
Librascope Inc.
Magnetrol, Inc.
Marquardt Aircraft Co.
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Airoil Burner Co.
Nuclear Corp. of America, Inc.
Parameters, Inc.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautical Corp.
Reaction Motors, Inc.
Research Controls
Servomechanisms, Inc.
A. U. Stone & Co., Inc.
Systron Corp.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
***VALCOR ENGRG. CORP.**
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.—Sperry Rand
Waldorf Instrument Co., Div.—F. C. Huyck & Sons
Waugh Engrg. Co.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.—Telecomputing Corp.

Fuel

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aerotec Corp., The
Airborne Research & Development Corp.
American Electronics, Inc., Data-Tronics Div.
Automatic Switch Co.
Barton Instrument Corp.
CDC Control Services, Inc.
Cadillac Gage Co.
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
Dynamic Controls Corp.
***EASTERN INDUSTRIES, INC.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Eddington Metal Specialty Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engelberg Huller Co., Inc.
Ess Instrumnet Co.
Essex Mfg. Co., Inc.
General Controls Co.
Hallamore Electronics Co.
Kelsey-Hayes Co.
Kemp Aero Products, Div.—Kemp Inc.
Koehler Aircraft Products Co., Inc.
Leeds & Northrup Co.
***WALLACE O. LEONARD, INC.**
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Minneapolis-Honeywell Regulator Co., Aeronautical Div.
National Airoil Burner Co.
Parameters, Inc.
Patterson, Moos Div.—Universal Winding Co., Inc.
Pierce Governor Co., Inc., The
Pioneer-Central Div., Bendix Aviation Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
Servomechanisms, Inc.
A. U. Stone & Co., Inc.
Systron Corp.
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Control Corp.
***VALCOR ENGRG. CORP.**
Vickers Inc., Div.—Sperry Rand
Waldorf Instrument Co., Div.—F. C. Huyck & Sons
Whittaker Controls, Div.—Telecomputing Corp.

Gas

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Automatic Switch Co.
Barton Instrument Corp.
CDC Control Services, Inc.
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
Clark Electronic Laboratories
Clary Dynamics
Consolidated Controls Corp.
***CORNELIUS CO., THE**
Devco Engrg. Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Engelberg Huller Co., Inc.
General Controls Co.
***GREER HYDRAULICS, INC.**
Hallamore Electronics Co.
Kelsey-Hayes Co.
Kemp Aero Products, Div.—Kemp Inc.
Koehler Aircraft Products Co., Inc.
Marquardt Aircraft Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
J. J. Monaghan Co., Inc.
National Airoil Burner Co.
Progressive Research & Development Co., Inc.
Research Controls
Servomechanisms Inc.
A. U. Stone & Co., Inc.
***VALCOR ENGRG. CORP.**
Thompson Products, Inc.
Waldorf Instrument Co., Div.—F. C. Huyck & Sons
Whittaker Controls, Div.—Telecomputing Corp.

Liquid Level

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
American Electronics, Inc., Data-Tronics Div.
Autonetics, Div.—North American Aviation, Inc.
Autotron, Inc.
Barton Instrument Corp.
Bogue Electric Mfg. Co.
CDC Control Services, Inc.
Clary Dynamics
Henry G. Dietz Co., Inc., The
Dynametrics Corp.
Dynamic Controls Corp.
Electric Eye Equipment Co.
Electronic Control Corp.
Electronics Corp. of America
Essex Mfg. Co., Inc.
Friez Instrument Div.-Bendix Aviation Corp.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Gulton Industries, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
***WALLACE O. LEONARD, INC.**
Liquidometer Corp., The
Magnetrol, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Narda Ultrasonics Corp., The
Nuclear Corp. of America, Inc.
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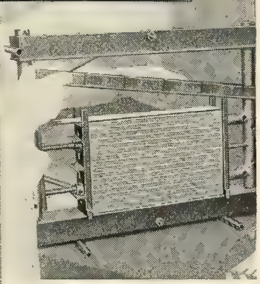
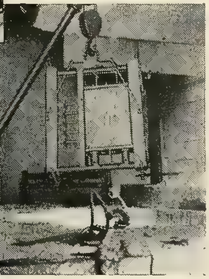
UAP worker assembles multiple parts in fixture for heat exchanger core. Gloves guard against contamination of aluminum prior to brazing.



Fixturing is complete. Assembly proceeds rapidly since bonding of parts is achieved in a single dip-brazing operation.

Pre-heat furnace assures 100% heat penetration of fixtured assembly prior to immersion in flux bath.



Fixtured assembly is lowered into flux pot. Molten brazing flux forms fillets for perfect bonding of parts.

Multiple baths remove all residual flux after brazing.

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Consolidated Controls Corp.
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Devco Engrg. Inc.
Dynametrics Corp.
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Exact Engrg. & Mfg. Inc.
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Kearfott Co., Inc.
Lear, Inc., Grand Rapids Div.
Librascope Inc.
Marquardt Aircraft Co.
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Northam Electronics, Inc.
Pacific Div.-Bendix Aviation Corp.
Reaction Motors, Inc.
Reid Metal Products, Inc.
Republic Aviation Corp., Guided Missiles Div.
Royal Industries, Inc.
Servomechanisms, Inc.
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Standard Armament Inc.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
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Marquardt Aircraft Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
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Servomechanisms, Inc.
Telectro Industries Corp.
Vickers Inc., Div.-Sperry Rand
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

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Barton Instrument Corp.
Black, Sivalls & Bryson, Inc.
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Clary Dynamics
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
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Dynametrics Corp.
Dynamic Controls Corp.
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Ellison Draft Gage Co.
Engelberg Huller Co., Inc.
Fairchild Controls Corp., Components Div.
*FIREWEL CO., INC., THE
Friez Instrument Div.-Bendix Aviation Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
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General Electric Co., Apparatus Sales Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
*GREER HYDRAULICS, INC.
Hallamore Electronics Co.
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
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Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Lear, Inc.
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Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
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Patterson, Moos Div.-Universal Winding Co., Inc.
Research Controls
Scientific Instrument Co.
Servomechanisms, Inc.
Systron Corp.
Tactair Valve Div.-Aircraft Products Co.
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*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.-Sperry Rand
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Reactor, Nuclear

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Consolidated Controls Corp.
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Leeds & Northrup Co.
Nuclear Corp. of America, Inc.
Progressive Research & Development Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Solar Aircraft Co.
Stanley Aviation Corp.
Telectro Industries Corp.
Thompson Products Inc.
United Shoe Machinery Corp.
*WESTINGHOUSE ELECTRIC CORP.

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CDC Control Services, Inc.
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Electronics Corp. of America
Ess Instrument Co.
General Electric Co., Apparatus Sales Div.
*KAHN & CO., INC.
Leeds & Northrup Co.
Telectro Industries Corp.

Smoke Density

Autotron, Inc.
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Electronics Corp. of America
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General Electric Co., Apparatus Sales Div
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Nuclear Corp. of America, Inc.
Systron Corp

Speed

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Consolidated Controls Corp.
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General Railway Signal Co.
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Telectro Industries Corp.
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Varo Mfg. Co.
Wacline, Inc.
Waugh Engrg. Co.

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Columbia Research Labs.
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Systron Corp.
Telectro Industries Corp.
Temperature Electronic
Ultradyne, Inc.
Advanced Electronics, Inc.
Airborne Accessories Corp.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Barber-Colman Co.
Briggs Associates, Inc.
CDC Control Services, Inc.
Cardinal Instrumentation Corp.
Consolidated Avionics Corp.
Consolidated Controls Corp.
Devco Engrg. Inc.
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Electronic Processes Corp. of California
Fenwal Inc.
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Hagan Chemicals & Controls, Inc.
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
North Atlantic Industries, Inc.
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Leeds & Northrup Co.
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Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Philadelphia Scientific Glass Co.
Resdel Engrg. Corp.
Systron Corp.
T-C Div., Dyna-Empire, Inc.
Telectro Industries Corp.
Thermo Electric Co., Inc.
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United Control Corp.
Vap-Air Div., Vapor Heating Corp.

Turbidity

Baird-Atomic, Inc.
CDC Control Services, Inc.
Clark Electronic Laboratories
Devco Engrg. Inc.
Ess Instrument Co.

Vacuum

Aerotec Corp., The
American Electronics, Inc., Data-Tronics Div.
Aro Equipment Corp., The
Barton Instrument Corp.
CDC Control Services, Inc.
Clark Electronic Laboratories
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
*CORNELIUS CO., THE
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General Electric Co., Apparatus Sales Div.
Green Rectifier Co.
High Vacuum Equipment Corp.
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Koehler Aircraft Products Co., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
NRC Equipment Corp.
Process & Instruments
Scientific Instrument Co.
Tactair Valve Div.-Aircraft Products Co.
U. S. Gauge Div., American Machine & Metals, Inc.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.

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Aro Equipment Corp., The
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*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
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COOLANTS

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Turco Products, Inc.
White & Bagley Co., The

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Dunham-Bush Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Trane Co., The
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Alden Products Co.
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Morris Bean & Co.
G-L Electronics Co., Inc.
General R-F Fittings, Inc.
Portland Copper & Tank Works Inc.
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E. F. Johnson Co.
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National Utilities Corp.
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Specialty Products Corp.
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Weatherhead Co., The

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American Flexible Coupling Div., Zurn Industries, Inc.
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Consolidated American Services, Inc.
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Dial Products Co.
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Walter K. Jaros, Aircrafters
E. F. Johnson Co.
Kerns Mfg. Corp.
Koppers Co., Inc., Metal Products Div.
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Progressive Research & Development Co., Inc.
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Renbrandt, Inc.
Rodney Metals Inc.
Sier-Bath Gear & Pump Co., Inc.
Snap-Tite, Inc.
Southwest Products Co.
Stainless Steel Products, Inc.
Titeflex, Inc.
Vemaline Products Co.
Weatherhead Co., The

Hydraulic

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American Brass Co., American Metal Hose Div.
American Flexible Coupling Div., Zurn Industries, Inc.
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Arkwin Industries, Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
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Avica Corp.
Clark Equipment Co.
Conax Corp.
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Electric Auto-Lite Co., The
Essex Mfg. Co., Inc.
Futurecraft Corp.
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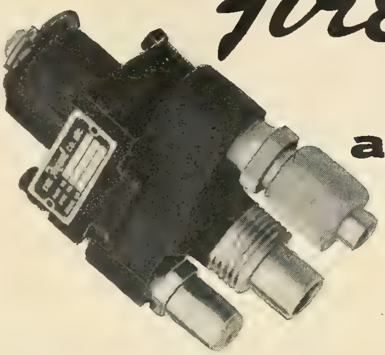
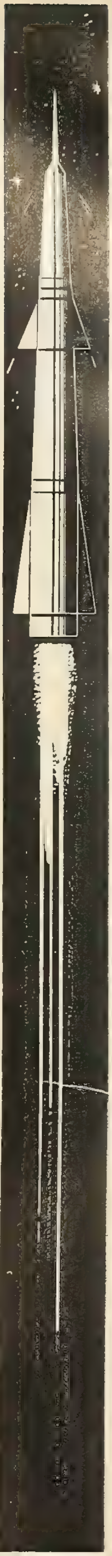
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.





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Weatherhead Co., The

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Dial Products Co.
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Thompson Products, Inc.
Wagner Awning & Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

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O & S Research, Inc.
Swiss Jewel Co.

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Bridgwater Machine Co.
Carter Controls, Inc.
***ELECTROL INC.**
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Harrisburg Steel Co.
Hydra-Power Corp.
Kelsey-Hayes Co.
Walter Kidde & Co., Inc., Aviation Div.
Ortman-Miller Machine Co. Inc.
Pacific Div.—Bendix Aviation Corp.
Petch Mfg. Co.
Pressed Steel Tank Co.
Wells Industries Corp.

CYLINDERS, COMPRESSED GAS

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Harrisburg Steel Co.
Herrick L. Johnston, Inc.
***KAHN & CO., INC.**
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Walter Kidde & Co., Inc., Aviation Div.
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Carter Controls, Inc.
***COOPER DEVELOPMENT CORP.**
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Food Machinery & Chemical Corp., Ordnance Div.
Goodyear Aircraft Corp.
Harrisburg Steel Co.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Reaction Motors, Inc.
Republic Aviation Corp., Guided Missiles Div.
Resdel Corp.
Ryan Aeronautical Co.
Thompson Products, Inc.
Wheland Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

DAMPERS, CONTROL

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Clemco Aero Products, Inc.
Cleveland Pneumatic Tool Co., The, Div.—Cleveland Pneumatic Industries, Inc.
G. M. Dykes Iron Works, Inc.
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Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Ozone Metal Products Corp.
Republic Aviation Corp., Guided Missiles Div.
Sesco Mfg., Inc.
Waldorf Instrument Co., Div.—F. C. Huyck & Sons

DAMPERS, PULSATION

Auto-Control Labs., Inc.
Clemco Aero Products, Inc.
Cleveland Pneumatic Tool Co., The, Div.—Cleveland Pneumatic Industries, Inc.
Consolidated Controls Corp.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
International Aerocoustics Corp.
Lyndon Aircraft, Inc.
Ozone Metal Products Corp.
Parker-Hannifin Corp.
Waldorf Instrument Co., Div.—F. C. Huyck & Sons

DAMPERS, VIBRATION & SHIMMY

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Clemco Aero Products, Inc.
Cleveland Pneumatic Tool Co., The, Div.—Cleveland Pneumatic Industries, Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
General Cable Corp.
Gray & Huleguard, Inc.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Hydra-Power Corp.
Lyndon Aircraft, Inc.
Menasco Mfg. Co.
Nopco Chemical Co.
Ozone Metal Products Corp.
Raybestos-Manhattan, Inc.
Rubbercraft Corp. of California
Sesco Mfg., Inc.
Titeflex, Inc.
United Mfg. Co., The
Waldorf Instrument Co., Div.—F. C. Huyck & Sons

DETECTORS, DETONATION

Atlantic Research Corp.
Telectro Industries Corp.
Ultradyne, Inc.

DETECTORS, FLAW & DEFECT, ELECTRONIC

Air Logistics Corp.
American Electronics, Inc.
General Electric Co., Apparatus Sales Div.

DIAPHRAGMS, JET ENGINE

Bendix Products Div., Bendix Aviation Corp.
Chicago-Allis Mfg. Corp.
Christie Machine Works
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Houston Fearless Corp.
Hupp Aviation Co.
Joclin Mfg. Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Portland Copper & Tank Works Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
Ryan Aeronautical Co.
Thompson Products, Inc.
Turbo Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

DIAPHRAGMS, JET ENGINE NOZZLE

Bendix Products Div., Bendix Aviation Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Haynes Stellite Co., Div.—Union Carbide Corp.
Houston Fearless Corp.
Hupp Aviation Co.
Joclin Mfg. Co.
Kerns Mfg. Corp.
***LYCOMING DIV., AVCO MFG. CORP.**
Portland Copper & Tank Works Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
Ryan Aeronautical Co.
Thompson Products, Inc.
Turbo Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

DIE CASTINGS

American Car & Foundry Div., ACF Industries, Inc.
Bendix Foundries, Bendix Aviation Corp.
Bendix Products Div., Bendix Aviation Corp.
Dale Products, Inc.
Dow Chemical Co., The
Electric Auto-Lite Co., The
Hampden Brass & Aluminum Co.
Hydro Molding Co. Inc.
P. R. Mallory & Co. Inc.
Stewart-Warner Corp.
Titan Metal Mfg. Co.
United Mfg. Co., The

DIES

Allied Engraving & Stamping Co.
American Car & Foundry Div., ACF Industries, Inc.
Basic Tool Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
Bergen Carbide Co.
Corning Glass Works
***DIVERSEY ENGRG. CO.**
Electric Auto-Lite Co., The
Electronic Techniques, Inc.
Henry & Miller Industries, Inc.
Walter J. Hyatt, Co., The
Walter K. Jaro, Aircrafters
Machine Engrg. Co. Inc.
Metal Masters, Inc.
Progressive Research & Development Co., Inc.
Spincraft, Inc.
Technical Oil Tool Corp.
Thompson Products, Inc.
Twix Mfg. Co., Inc.
Western Arc Welding, Inc.

DIFFUSERS, GAS TURBINE ENGINE

Airborne Research & Development Corp.
American Welding & Mfg. Co., The
Amplex Div.—Chrysler Corp.
Bendix Products Div., Bendix Aviation Corp.
Eaton Mfg. Co., Inc., Fredric Flader Div.
General Sound Control, Inc.
Herlo Engrg. Corp.
Houston Fearless Corp.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.—Kaiser Industries Corp.
Kelsey-Hayes Co.
*LYCOMING DIV., AVCO MFG. CORP.
Portland Copper & Tank Works Inc.
*RHEEM MFG. CO., AIRCRAFT DIV.
Ryan Aeronautical Co.
Solar Aircraft Co.
Spincraft, Inc.
Turbo Products, Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

DISCONNECTS, CONTROL SYSTEMS

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aeroquip Corp.
Aerotec Corp., The
Airborne Research & Development Corp.
Beckman & Whitley, Inc., Missile Products Div.
Bendix Products Div., Bendix Aviation Corp.
Burndy Corp., Omaton Div.
Clemco Aero Products, Inc.
Coaxial Connector Co. Inc.
Futurecraft Corp.
*HYDROMATICS, INC.
McCormick Selph Associates
Scintilla Div., Bendix Aviation Corp.
Stanley Aviation Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Titeflex, Inc.
Weatherhead Co., The

DISCONNECTS, IGNITION SYSTEMS

Airborne Research & Development Corp.
Alden Products Co.
Beckman & Whitley, Inc., Missile Products Div.
Bendix Products Div., Bendix Aviation Corp.
Burndy Corp., Amaton Div.
Hallett Mfg. Co.
McCormick Selph Associates
Scintilla Div., Bendix Aviation Corp.
Stanley Aviation Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Titeflex, Inc.

DISSIPATORS, HEAT

Amplex Div.-Chrysler Corp.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Telectro Industries Corp.
Trane Co., The
*UNITED AIRCRAFT PRODUCTS, INC.

DISTRIBUTORS, FUEL

Bendix Products Div., Bendix Aviation Corp.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

DISTRIBUTORS, IGNITION

Electric Auto-Lite Co., The
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.

DRIVES, TORQUE TUBE

American Flexible Coupling Div., Zurn Industries, Inc.
Western Arc Welding, Inc.

DROP FORGINGS

Aircraft Mechanics, Inc.
Aluminum Co. of America
American Car & Foundry Div., ACF Industries Inc.
American Steel Foundries, Hammond Div.
Bendix Products Div., Bendix Aviation Corp.
*BILLINGS & SPENCER CO., THE
Bridgeport Brass Co.
Capewell Mfg. Co.
Columbus Bolt & Forging Co.
G. M. Dykes Iron Works, Inc.
Endicott Forging & Mfg. Co., Inc.
General Railway Signal Co.
Kaiser Aluminum & Chemical Sales, Inc.
Kelsey-Hayes Co.
Ladish Co.
P. R. Mallory & Co. Inc.
H. K. Porter Inc.
Steel Improvement & Forge Co., The
Thompson Products, Inc.
Transue & Williams Steel Forging Corp.
United Mfg. Co., The
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
*WESTINGHOUSE ELECTRIC CORP.
J. H. Williams Co.
Winchester-West. Div.-Olin Mathieson Chem. Corp.

DUCTS, EXHAUST

ACF Industries, Inc., Advanced Products Div.
Aircraft Mechanics, Inc.
American Brass Co., American Metal Hose Div.
American Welding & Mfg. Co., The
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Associated Co., Inc.
Avica Corp.
Basic Tool Industries, Inc.
Beaton & Corbin Mfg. Co., The
Calcor Corp., Aircraft Div.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Cromer Mfg. & Engrg., Inc.
Flexaust Co., The
Henry & Miller Industries, Inc.
Herlo Engrg. Corp.
Houston Fearless Corp.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
*LAVELLE AIRCRAFT CORP.
Marquardt Aircraft Co.
New England Tape Co., Inc.
Parish Pressed Steel, Div.-Dana Corp.
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works Inc.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Stainless Steel Products, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Titeflex, Inc.
*C. W. TORNGREN CO., INC.
*UNITED AIRCRAFT PRODUCTS, INC.
United Mfg. Co., The
Universal Metal Products Inc.
Wayne Foundry & Stamping Co.
Weber Aircraft Corp.
Western Arc Welding, Inc.
Winder Aircraft Corp. of Fla.

DUCTS, FLEXIBLE & COMPRESSIBLE

Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Basic Tool Industries, Inc.
Beaton & Corbin Mfg. Co., The
California Aircraft Products
Connecticut Hard Rubber Co., The
D K Mfg. Co.
C. R. Daniels, Inc.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
New England Tape Co. Inc.
Rohr Aircraft Corp.
Rubbercraft Corp. of California
Ryan Aeronautical Co.
Solar Aircraft Co.
Southwest Products Co.
Stainless Steel Products, Inc.
TA Mfg. Corp.
Thompson Products, Inc.
Titeflex, Inc.
Wagner Awning & Mfg. Co., The
Winder Aircraft Corp. of Fla.

DUCTS, NON FLEXIBLE

Aircraft Mechanics, Inc.
Amercoat Corp.
*AMERICAN TUBE BENDING CO., INC.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Basic Tool Industries, Inc.
Beaton & Corbin Mfg. Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Hastings Plastics Inc.
Ludwig Honold Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
*LAVELLE AIRCRAFT CORP.
New England Tape Co., Inc.
Plastic Age Sales, Inc.
Portland Copper & Tank Works Inc.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Turbo Products, Inc.
United Mfg. Co., The
Universal Metal Products Inc.
Weber Aircraft Corp.
Winder Aircraft Corp. of Fla.
Woolf Aircraft Products, Inc.

DYNAMOTORS

Carter Motor Co.
Joe Davidson & Associates
W. C. Dillon & Co., Inc.
Eicor Div.-F. L. Jacobs Co.
Electric Auto-Lite Co., The
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hoover Electric Co.
*INTERELECTRONICS CORP.
Motordyne Inc.
Propulsion Research Corp.
Small Motors Inc.
Talley Corp., The
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.

ELECTROPLATING EQUIPMENT

Aerodex, Inc.
Green Rectifier Co.
Hammett Electric Co.
George L. Nankervis Co.
Sel-Rex Corp.
*WESTINGHOUSE ELECTRIC CORP.

EMBEDDED ASSEMBLIES

Advance Industries, Inc.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
Airflyte Electronics Co.
Allied Engraving & Stamping Co.
Bacon Industries, Inc.
Cleveland Metal Specialties Co.
*COOPER DEVELOPMENT CORP.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Electronic Techniques, Inc.
First Electronics Corp., The
La Pointe Industries Inc.
Precision, Inc.
Sohl Co., The
Telectro Industries Corp.
Tempo Instrument Inc.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
Ultradyne, Inc.
Uniwave, Inc.

ENGINE ACCESSORIES & COMPONENTS

ACF Industries, Inc., Advanced Products Div.
Aero Supply Mfg. Co., Inc.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Standard Products, Inc.
American Tool Co.
Applied Dynamics Corp.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Beaton & Corbin Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Christie Machine Works
*DIVERSEY ENGRG. CO.
Dynamic Controls Corp.
Engineered Products Co., The
Essex Mfg. Co., Inc.
Federal Machine Co. Inc.
Foote Brothers Gear & Machine Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Sound Control, Inc.
*HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.
Hicks Corp., The
Hupp Aviation Co.
Walter J. Hyatt Co., The
Joclin Mfg. Co.
Kerns Mfg. Corp.
Koehler Aircraft Products Co., Inc.
*LAMINATED SHIM CO.
La Pointe Industries Inc.
R. C. Mahon Co., The
Merz Engrg., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
New York Air Brake Co., The, Watertown Div.
Ozone Metal Products Corp.
Parish Pressed Steel, Div.-Dana Corp.
Parker Aircraft Co.
*PHOENIX PRODUCTS CO.
Reaction Motors, Inc.
*RHEEM MFG. CO., AIRCRAFT DIV.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
*STAINLESS PROCESSING DIV., WALL COLMONY CORP.
A. U. Stone & Co., Inc.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
T-C Div., Dyna-Empire, Inc.
Telectro Industries Corp.
Thompson Products, Inc.

Turbo Products, Inc.
***VALCOR ENGRG. CORP.**
Vinco Corp.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weatherhead Co., The
***WESTINGHOUSE ELECTRIC CORP.**
Weston Hydraulics, Ltd.

ENGINE CONTROL SYSTEMS, AUTOMATIC

Air Logistics Corp.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Autonetics, Div.-North American Aviation, Inc.
Bendix Products Div., Bendix Aviation Corp.
Briggs Associates, Inc.
CDC Control Services, Inc.
Cadillac Gage Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Cutler-Hammer Inc.
Dynamic Controls Corp.
Fenwal Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***GREER HYDRAULICS, INC.**
Hallamore Electronics Co.
Hoover Electric Co.
***KAHN & CO., INC.**
Librascope Inc.
Marquardt Aircraft Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Parameters, Inc.
Reaction Motors, Inc.
Reid Metal Products, Inc.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Solar Aircraft Co.
Telectro Industries Corp.
Thompson Products, Inc.
U. S. Gauge Div.,-American Machine & Metals, Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Wright Aeronautical Div., Curtiss-Wright Corp.

ENGINE CONTROLS, MECHANICAL & VACUUM

Aero Supply Mfg. Co., Inc.
All American Aircraft Products, Inc.
Bendix Products Div., Bendix Aviation Corp.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Essex Mfg. Co., Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***GREER HYDRAULICS, INC.**
Hoover Electric Co.
***KAHN & CO., INC.**
Lyndon Aircraft, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Ozone Metal Products Corp.
Parker Aircraft Co.
Reid Metal Products, Inc.
Servomechanisms, Inc.
Solar Aircraft Co.
Southwest Products Co.
Telectro Industries Corp.
Teleflex Inc.
Thompson Products, Inc.
U. S. Gauge Div.,-American Machine & Metals Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Western Arc Welding, Inc.
Whittaker Controls, Div.-Telecomputing Corp.

ENGINES

American Welding & Mfg. Co., The
Continental Aviation & Engrg. Corp.
***DIVERSEY ENGRG. CO.**
B. F. Goodrich Aviation Products
Eaton Mfg. Co., Inc., Fredric Flader Div
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***LYCOMING DIV., AVCO MFG. CORP.**

Auxiliary Jet

American Rocket Co.
American Welding & Mfg. Co., The
Continental Aviation & Engrg. Corp.
Eaton Mfg. Co., Inc., Fredric Flader Div.
***LYCOMING DIV., AVCO MFG. CORP.**
Solar Aircraft Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Auxiliary Rocket

American Rocket Co.
Anderson, Greenwood & Co.
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
B. F. Goodrich Aviation Products
***GRAND CENTRAL ROCKET CO.**
***LYCOMING DIV., AVCO MFG. CORP.**
McCormick Selph Associates
Merz Engrg., Inc.
Reaction Motors, Inc.
Redstone Arsenal Research Div., Rohm & Haas Co.
Solar Aircraft Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Thompson Products, Inc.
Turbo Dynamics Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Diesel

Detroit Diesel Engine Div.-General Motors Corp.
Turbo Dynamics Corp.

Gas Turbine

American Welding & Mfg. Co., The
Atlantic Research Corp.
Continental Aviation & Engrg. Corp.
Eaton Mfg. Co., Inc., Fredric Flader Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
***LYCOMING DIV., AVCO MFG. CORP.**
Solar Aircraft Co.
Thompson Products, Inc.
Turbo Dynamics Corp.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

Nuclear Rocket

Celco-Constantine Engrg. Laboratories Co.
Geisler Labs.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Rocketdyne Div., North American Aviation, Inc.
Solar Aircraft Co.
Turbo Dynamics Corp.
Wave Particle Corp.

Nuclear Turbine

***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
Rocketdyne Div., North American Aviation, Inc.
Solar Aircraft Co.
Turbo Dynamics Corp.
Wave Particle Corp.

Pulse Jet

Finn Aeronautical Div., T. R. Finn & Co., Inc.
Marquardt Aircraft Co.
Solar Aircraft Co.

Ramjet

American Welding & Mfg. Co., The
Anderson, Greenwood & Co.
Continental Aviation & Engrg. Corp.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Marquardt Aircraft Co.
Solar Aircraft Co.
Turbo Dynamics Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Rocket

American Welding & Mfg. Co., The
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
G. W. Galloway Co.
Hercules Powder Co.
Hicks Corp., The
Ingersoll Kalamazoo Div., Borg-Warner Corp.
McCormick Selph Associates
Merz Engrg., Inc.
Oerlikon Tool & Arms Corp. of America
Propellex Chemical Corp.
Reaction Motors, Inc.
Redstone Arsenal Research Div., Rohm & Haas Co.
Rocketdyne Div., North American Aviation, Inc.
Solar Aircraft Co.
Thompson Products, Inc.
Turbo Dynamics Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Rocket, Liquid

American Rocket Co.
American Welding & Mfg. Co., The
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hicks Corp., The
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Merz Engrg., Inc.
Parish Pressed Steel, Div.-Dana Corp.
Reaction Motors, Inc.
Rocketdyne Div., North American Aviation, Inc.
Solar Aircraft Co.
Thompson Products, Inc.
Veet Industries
Wright Aeronautical Div., Curtiss-Wright Corp.

Rocket, Solid

American Rocket Co.
American Welding & Mfg. Co., The
Anderson, Greenwood & Co.
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
G. W. Galloway Co.
B. F. Goodrich Aviation Products
Goodyear Aircraft Corp.
***GRAND CENTRAL ROCKET CO.**
Hercules Powder Co.
Hicks Corp., The
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Kellett Aircraft Corp.
McCormick Selph Associates
Oerlikon Tool & Arms Corp. of America
Parish Pressed Steel Div.-Dana Corp.
Propellex Chemical Corp.
Reaction Motors, Inc.
Redstone Arsenal Research Div., Rohm & Haas Co.
Republic Aviation Corp., Guided Missiles Div.
Solar Aircraft Co.
Thompson Products, Inc.
Turbo Dynamics Corp.
Wheland Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

EXHAUST ASSEMBLIES

ACF Industries, Inc., Advanced Products Div.
Aircraft Mechanics, Inc.
American Brass Co., American Metal Hose Div.
***AMERICAN MACHINE & FOUNDRY CO.**
Associated Co., Inc.
Beaton & Corbin Mfg. Co., The
California Aircraft Products
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
General Sound Control, Inc.
Henry & Miller, Industries, Inc.
Hicks Corp., The
Ludwig Honold Mfg. Co.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Marquardt Aircraft Co.
Parish Pressed Steel, Div.-Dana Corp.
Penn Michigan Mfg. Corp
Portland Copper & Tank Works Inc.
Republic Aviation Corp., Guided Missiles Div.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Mfg. Co., The
Universal Machine Co., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Woolf Aircraft Products, Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

EXHAUST CONES, GAS TURBINE ENGINE

ACF Industries, Inc., Advanced Products Div.
American Welding & Mfg. Co., The
Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
***LYCOMING DIV., AVCO MFG. CORP.**
Marquardt Aircraft Co.
Olympic Plastics Co., Inc.
Parish Pressed Steel, Div.-Dana Corp.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Republic Aviation Corp., Guided Missiles Div.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Size Control Co.
Smith-Morris Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
Turbo Products, Inc.
United Mfg. Co., The
Veet Industries
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**

EXHAUST HEAT EXCHANGERS

ACF Industries, Inc., Advanced Products Div.
Cromer Mfg. & Engrg., Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Griscom-Russell Co., The

Hupp Aviation Co.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
*LYCOMING DIV., AVCO MFG. CORP.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Thompson Products, Inc.
Trane Co., The
*UNITED AIRCRAFT PRODUCTS, INC.

EXHAUST NOZZLES

American Aerophysics Corp.
American Car & Foundry Div., ACF Industries, Inc.
American Welding & Mfg. Co., The
Associated Co., Inc.
Bridgwater Machine Co.
California Aircraft Products
*CAMERON IRON WORKS, INC.
Christie Machine Works
Continental Diamond Fibre Corp., Sub.-The Budd Co.
*COOPER DEVELOPMENT CORP.
Corning Glass Works
*DIVERSEY ENGRG. CO.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Federal Machine Co. Inc.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
General Sound Control, Inc.
Hupp Aviation Co.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
Marquardt Aircraft Co.
Menasco Mfg. Co.
Olympic Plastics Co., Inc.
Parish Pressed Steel, Div.-Dana Corp.
*PHOENIX PRODUCTS CO.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Republic Aviation Corp., Guided Missiles Div.
*RHEEM MFG. CO., AIRCRAFT DIV.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Size Control Co.
Smith-Morris Corp.
Solar Aircraft Co.
Thompson Products, Inc.
*C. W. TORNGREN CO., INC.
Turbo Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Wheland Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

EXTRUSIONS, METALLIC

Aluminum Co. of America
American Brass Co., The
Ampco Metal, Inc.
Babcock & Wilcox Co. Tubular Products Div.
Bridgeport Brass Co.
*CAMERON IRON WORKS, INC.
Eagle-Picher Co., The
Fromson Orban Co., Inc.
Harvey Aluminum
Kelsey-Hayes Co.
Ladish Co.
Pioneer Aluminum Inc.
Titan Metal Mfg. Co.
Turbo Dynamics Corp.
United Shoe Machinery Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Winchester-West, Div.-Olin Mathieson Chem. Corp.

EXTRUSIONS, NON METALLIC

Allied Plastics Supply Corp.
American Lava Corp.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Clark-Aiken Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Continental Rubber Works
Crystal-X Corp.
Dixon Corp.
Electric Auto-Lite Co., The
Enflo Corp.
Fluorocarbon Co. Inc., The
Jodee Plastics Co.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
Rex Corp., The
Roberts Toledo Rubber Co., The
Rubatex Div., Great American Industries Inc.
Rubbercraft Corp. of California
Varflex Corp.

FABRICATORS, POWDERED METAL PARTS

Aluminum Co. of America
Amplex Div.-Chrysler Corp.
Bergen Carbide Co.
Cuno Engrg. Corp., The
Alfred Hofmann & Co.
Raybestos-Manhattan, Inc.

St. Marys Carbon Co.
Thompson Products, Inc.
S. K. Wellman Co., The
*WESTINGHOUSE ELECTRIC CORP.

FANS

Air-Marine Motors, Inc.
Ashland Electric Products, Inc.
Joe Davidson & Associates
Dean & Benson Research Inc.
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammett Electric Co.
Joy Mfg. Co.
Master Appliance Mfg. Co.
Motordyne Inc.
Propulsion Research Corp.
Task Corp.
*WESTINGHOUSE ELECTRIC CORP.

FASTENERS

Adams Rite Mfg. Co.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
American Brass Co., The
Aviation Developments Inc.
Bland Burner Co., The
Boots Aircraft Nut Corp.
Briles Mfg.
Camloc Fastener Corp.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Chicago Screw Co., The, Div.-Standard Screw Co.
Columbus Bolt & Forging Co.
J. P. DeVine Mfg. Co.
Dimco-Gray Co.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
Federal Screw Products Inc.
Hi-Shear Rivet Tool Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kickhaefer Mfg. Co.
Nutt-Shel Co.
Reed & Prince Mfg. Co.
Rosan, Inc.
Shur-Lok Corp.
Standard Pressed Steel Co.
Thompson-Bremer & Co.
Torrington Co., The
*TOWNSEND CO., CHERRY RIVET DIV.
United Shoe Machinery Corp.
Waldom Electronics Inc.
Wrought Washer Mfg. Co.

Blind

Aviation Developments Inc.
Boots Aircraft Nut Corp.
Brush Nail Expansion Bolt Co.
Century Fasteners Corp.
Dill Mfg. Co., The
R. C. Dudek & Co.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
Hi-Shear Rivet Tool Co.
Huck Mfg. Co.
Walter K. Jaros, Aircrafters
Shur-Lok Corp.
United Shoe Machinery Corp.

Cowl

Adams Rite Mfg. Co.
Aviation Developments Inc.
Camloc Fastener Corp.
Century Fasteners Corp.
*COMMERCIAL SHEARING & STAMPING CO.
Dumont Aviation Associates
Walter K. Jaros, Aircrafters
Shaw Metal Products Corp.
Simmonds Aerocessories, Inc.
Stewart-Warner Corp.
United-Carr Fastener Corp.

Self-Locking

Abbott Screw & Mfg. Co.
American Standard Products, Inc.
Aviation Developments Inc.
Boots Aircraft Nut Corp.
Camloc Fastener Corp.
*COMMERCIAL SHEARING & STAMPING CO.
Corbin Products Div.
Dill Mfg. Co., The
Dimco-Gray Co.
R. C. Dudek & Co.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
Heli-Coil Corp.
Hi-Shear Rivet Tool Co.
Huck Mfg. Co.
Jacobson Nut Mfg. Corp.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Klincher Locknut Corp.
Nutt-Shel Co.
Republic Steel Corp.
Shur-Lok Corp.

Standard Pressed Steel Co.
Thompson-Bremer & Co.
United-Carr Fastener Corp.

SLIDE

Corbin Products Div.
Walter K. Jaros, Aircrafters
Talon, Inc.

Snap

Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Walter K. Jaros, Aircrafters
United-Carr Fastener Corp.
Vemaline Products Co.

FEED SYSTEMS

Fischer & Porter Co.
Milton Roy Co.
Thompson Products, Inc.

FELT & FELT PARTS

Aero Leather Products Co.
American Felt Co.
Auburn Mfg. Co., The
Booth Felt Co. Inc.
Commonwealth Felt Co.
C. R. Daniels, Inc.
Gasket Mfg. Co. Inc.
General Gasket Inc.
Penn Fibre & Specialty Co., Inc.
Standard Felt Co.

FERRIC OXIDES

Columbian Carbon Co., Mapico Color Unit
Foote Mineral Co.

FERRITES

Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Ferroxcube Corp. of America
General Instrument Corp., Defense Products Div.
Walter J. Hyatt Co., The
Kearfott Co., Inc.
Magnetic Shield Div.—Perfection Mica Co.
D. M. Steward Mfg. Co.
Superex Electronics Corp.
Thermo Materials, Inc.

FIBER GLASS

Aero Leather Products Co.
Allied Plastics Supply Corp.
American Aerophysics Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Calfibe Co., Inc.
Duracote Corp.
Eagle-Picher Co., The
Hastings Plastics Inc.
Ideal-Aerosmith, Inc.
Walter Kidde & Co., Inc., Aviation Div.
L. O. F. Glass Fibers Co.
Mast Development Co., Inc.
Seaman Products
William W. Stanley Co. Inc.
H. I. Thompson Fiber Glass Co.
Thompson Products, Inc.
Truxton Industries, Inc.
Varflex Corp.
Warren Wire Co.

FIBER GLASS REINFORCED PLASTICS

Aerolite Electronics Corp.
Air Logistics Corp.
Allied Plastics Supply Corp.
Amercoat Corp.
American Aerophysics Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Basic Tool Industries, Inc.
Calfibe Co., Inc.
Coleman Engrg. Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Cordo Molding Products, Inc.
Duracote Corp.
Dwyer Engrg. Co., Inc.
Eagle-Picher Co., The
Electronic Techniques, Inc.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Food Machinery & Chemical Corp., Ordnance Div.
Franklin Fibre-Lamitex Corp.
Garrett Corp., The, Air Cruisers Div.
General Plastics Corp. of New Jersey
B. F. Goodrich Aviation Products
Goodyear Aircraft Corp.
Hampden Brass & Aluminum Co.
Hastings Plastics Inc.
Hays Mfg. Co.
Ideal-Aerosmith, Inc.
Joclin Mfg. Co.
Walter Kidde & Co., Inc., Aviation Div.
Lamtex Industries, Inc.

. . . propulsion system

***LONE STAR PLASTICS CO. INC.**
McMillan Industrial Corp.
Mercury International Industries Inc.
Narmco Resins & Coatings Co.
New England Laminates Co., Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Olympic Plastics Co., Inc.
Plastic Age Sales, Inc.
Republic Aviation Corp., Guided Missiles Div.
Resdel Corp.
Silicone Insulation, Inc.
Stevens Products, Inc.
Swedlow Plastics Co.
Synthane Corp.
Thieblot Aviation Co., Div.—Vitro Corp. of America
H. I. Thompson Fiber Glass Co.
Thompson Products, Inc.
Topper Mfg. Co., Inc.
Truxton Industries, Inc.
Waterbury Companies, Inc.
Winchester West. Div.—Olin Mathieson Chem. Corp.

FILTERS

Aero Supply Mfg. Co., Inc.
Aircraft Porous Media, Inc.
Amplex Div.—Chrysler Corp.
Bendix Aviation Corp., Skinner-Poroloy Div.
Commercial Filters Corp.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
Futurecraft Corp.
Harman Equipment Co.
***KAHN & CO., INC.**
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Permanent Filter Corp.
Poroloy Equipment, Inc.
Milton Roy Co.
St. Marys Carbon Co.
William W. Stanley Co. Inc.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

Air

Aero Supply Mfg. Co., Inc.
Aircraft Porous Media, Inc.
Air-Maze Corp.
Allied Witan Co. Inc.
Amplex Div.—Chrysler Corp.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Clary Dynamics
Commercial Filters Corp.
Consolidated American Services, Inc.
Coppus Engrg. Corp.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
Flock Process Co. Inc.
Fram Corp.
Futurecraft Corp.
General Cable Corp.
General Sound Control, Inc.
Harman Equipment Co.
Hastings Plastics Inc.
***KAHN & CO., INC.**
Walter Kidde & Co., Inc., Aviation Div.
Mine Safety Appliances Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Permanent Filter Corp.
Poroloy Equipment, Inc.
Research Products Corp.
Milton Roy Co.
St. Marys Carbon Co.
William W. Stanley Co. Inc.
Turbo Products, Inc.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.
Winslow Aerofilter Corp.

Detonation

Cuno Engrg. Corp., The
General Sound Control, Inc.
Winder Aircraft Corp. of Fla.

Equalizer

Air-Maze Corp.
Tobe Deutschmann Corp.

Fuel & Oil

Aero Supply Mfg. Co., Inc.
Aeroproducts Operations, Allison Div., General Motors Corp.
Aircraft Porous Media, Inc.
Amplex Div.—Chrysler Corp.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Commercial Filters Corp.
Consolidated American Services Inc.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
Fram Corp.
General Cable Corp.
Harman Equipment Co.
Hastings Plastics Inc.
Walter J. Hyatt Co., The
Imperial Brass Mfg. Co., The
Herrick L. Johnston, Inc.
***KAHN & CO., INC.**
Marvel Engrg. Co.
Michigan Wire Cloth Co.
National Airoil Burner Co.
Permanent Filter Corp.
Poroloy Equipment, Inc.
St. Marys Carbon Co.
Universal Metal Products Inc.
Wells Industries Corp.
Winslow Aerofilter Corp.

Line

Aircraft Porous Media, Inc.
Amplex Div.—Chrysler Corp.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Commercial Filters Corp.
Cuno Engrg. Corp., The
Fram Corp.
Walter J. Hyatt Co., The
Marvel Engrg. Co.
Michigan Wire Cloth Co.
Newark Wire Cloth Co.
Permanent Filter Corp.
Poroloy Equipment, Inc.
Potter Co., The
Tobe Deutschmann Corp.
Wells Industries Corp.
Winslow Aerofilter Corp.

Mechanical

Aero Supply Mfg. Co., Inc.
Aircraft Porous Media, Inc.
Air-Maze Corp.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Cuno Engrg. Corp., The
Fram Corp.
General Cable Corp.
***KAHN & CO., INC.**
Marvel Engrg. Co.
Permanent Filter Corp.
Poroloy Equipment, Inc.
Telectro Industries Corp.
Wells Industries Corp.
Winslow Aerofilter Corp.

Pneumatic System

Aero Supply Mfg. Co., Inc.
Aircraft Porous Media, Inc.
Air-Maze Corp.
Allied Witan Co. Inc.
Aro Equipment Corp., The
Auto-Control Labs., Inc.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Champion Pneumatic Machinery Co.
Commercial Filters Corp.
***CORNELIUS CO., THE**
Cuno Engrg. Corp., The
Devilbiss Co., The
Fenwal Inc.
Futurecraft Corp.
General Cable Corp.
***KAHN & CO., INC.**
Walter Kidde & Co., Inc., Aviation Div.
Michigan Wire Cloth Co.
Patterson, Moos Div.—Universal Winding Co., Inc.
Permanent Filter Corp.
Poroloy Equipment, Inc.
Turbo Products, Inc.
Wells Industries Corp.
Winslow Aerofilter Corp.

FIRE DETECTORS

Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Cardinal Instrumentation Corp.
Electronics Corp. of America
Walter Kidde & Co., Inc., Aviation Div.
Norton Associates, Inc.
Piezo Products Co.

FIRE WALLS

Aircraft Mechanics, Inc.
Hastings Plastics Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
L. O. F. Glass Fibers Co.
***LAVELLE AIRCRAFT CORP.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Solar Aircraft Co.
Wells Industries Corp.

FITTINGS, COAXIAL CABLE

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Hallett Mfg. Co.
Marco Industries Co.
Progressive Research & Development Co., Inc.
Solar Aircraft Co.
TA Mfg. Corp.
Titeflex, Inc.
Warren Wire Co.
Western International Co.

FITTINGS, METALLIC

Aeroquip Corp.
Affiliated Screw Products Co.
Avica Corp.
Bridgwater Machine Co.
Capewell Mfg. Co.
Century Fasteners Corp.
Collins Engrg. Corp.
Corbin Products Div.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Freeman Co., The
Kerns Mfg. Corp.
Parker Aircraft Co.
Parker-Hannifin Corp.
Progressive Research & Development Co., Inc.
Rattan Mfg. Co., The
Resistoflex Corp.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
Solar Aircraft Co.
Thompson Products, Inc.
Titeflex, Inc.
United Mfg. Co., The
Vibra Seal Corp.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.

FLAMEHOLDERS, RAM JET

American Aerophysics Corp.
American Welding & Mfg. Co., The
California Aircraft Products
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hupp Aviation Co.
***LAVELLE AIRCRAFT CORP.**
Marquardt Aircraft Co.
Parker Aircraft Co.
Port and Copper & Tank Works Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

FLUID METERING PUMP SYSTEMS

Eco Engrg. Co.
New York Air Brake Co., The, Watertown Div.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Task Corp.
United Control Corp.

FLUID MOTORS

American Brake Shoe Co., Kellogg Div.
American Flexible Coupling Div., Zurn Industries, Inc.
Cadillac Gage Co
***COMMERCIAL SHEARING & STAMPING CO.**
New York Air Brake Co., The, Watertown Div.
Oil-Dyne, Inc.
Pesco Products Div.-Borg-Warner Corp.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Task Corp.

FLUIDS, HYDRAULIC OILS, COOLANTS, ETC.

Esso Standard Oil Co.
General Chemical Div., Allied Chemical & Dye Corp.
Lehigh Chemical Co.
Monsanto Chemical Co.
Silicones Div.-Union Carbide Corp.
White & Bagley Co., The

FLYWHEELS

Bridgwater Machine Co.
Transue & Williams Steel Forging Corp.

FUEL SYSTEMS & EQUIPMENT

Aero Supply Mfg. Co., Inc.
Aerotec Corp., The
American Tool Co.
Arkwin Industries, Inc.
Auto-Control Labs., Inc.
Calcor Corp., Aircraft Div.
California Aircraft Products
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Chiksan Co.
Consolidated Controls Corp.
***EASTERN INDUSTRIES, INC.**
Eddington Metal Specialty Co.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
***GREER HYDRAULICS, INC.**
***KAHN & CO., INC.**
Lear, Inc.
Marquardt Aircraft Co.

Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Parameters, Inc.
Parker Aircraft Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Telectro Industries Corp.
Thompson Products, Inc.
*VALCOR ENGRG. CORP.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

Balancing Controls

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
CDC Control Services, Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Dynamic Controls Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Kelsey-Hayes Co.
Marquardt Aircraft Co.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
*VALCOR ENGRG. CORP.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

Flow Dividers or Distributors

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Automatic Switch Co.
Bendix Products Div., Bendix Aviation Corp.
Clary Dynamics
Consolidated Controls Corp.
*EASTERN INDUSTRIES, INC.
Ex-Cell-O Corp.
Fischer & Porter Co.
Hydra-Power Corp.
Marquardt Aircraft Co.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pierce Governor Co., Inc., The
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautical Corp.
Thompson Products, Inc.
*VALCOR ENGRG. CORP.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Injection Equipment

Aero Supply Mfg. Co., Inc.
California Aircraft Products
Wright Aeronautical Div., Curtiss-Wright Corp.
Bendix Products Div., Bendix Aviation Corp.
Eddington Metal Specialty Co.
Ex-Cell-O Corp.
Hydra-Power Corp.
Marquardt Aircraft Co.
Parker Aircraft Co.
Progressive Research & Development Co., Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Thompson Products, Inc.
*VALCOR ENGRG. CORP.
Veet Industries

Lines

Aeroquip Corp.
*AMERICAN TUBE BENDING CO., INC.
Beaton & Corbin Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
Chiksan Co.
Consolidated American Services, Inc.
Flexible Metal Hose Mfg. Co.
Herrick L. Johnston, Inc.
MB Mfg. Co.
Reaction Motors, Inc.
Resistoflex Corp.
Stainless Steel Products, Inc.
*STALKER DEVELOPMENT CO.
Titeflex, Inc.
Weatherhead Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

Mixture Controls, Automatic

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Fairchild Controls Corp., Components Div.
Fischer & Porter Co.
Kelsey-Hayes Co.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
*POTTER AERONAUTICAL CORP.
Servomechanisms, Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Thompson Products, Inc.
Waugh Engrg. Co.
G. C. Wilson & Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Pressure Gauges

Barton Instrument Corp.
Consolidated Controls Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
*KAHN & CO., INC.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Northam Electronics, Inc.
Progressive Research & Development Co., Inc.
*ROCHESTER MFG. CO. INC.
U. S. Gauge Div.-American Machine & Metals, Inc.

Pressure Warning Units

Aerotec Corp., The
Barton Instrument Corp.
Bendix Products Div., Bendix Aviation Corp.
Carleton Aviation Co., Inc.
Consolidated Controls Corp.
Essex Mfg. Co., Inc.
General Controls Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Northam Electronics, Inc.
Permanent Filter Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.
G. C. Wilson & Co.

Pumps

Applied Dynamics Corp.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
*EASTERN INDUSTRIES, INC.
Eco Engrg. Co.
Electronic Communications, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kerns Mfg. Corp.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Marquardt Aircraft Co.
Motordyne Inc.
National Airoil Burner Co.
W. H. Nichols Co.
Pesco Products Div.-Borg-Warner Corp.
Reaction Motors, Inc.
Sier-Bath Gear & Pump Co., Inc.
Stewart-Warner Corp.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Task Corp.
Thompson Products, Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Ratio Controllers

Acoustica Associates, Inc.
American Electronics, Inc., Data-Tronics Div.
Barton Instrument Corp.
CDC Control Services, Inc.
Dynamic Controls Corp.
Fischer & Porter Co.
*WALLACE O. LEONARD, INC.
Marquardt Aircraft Co.
Potter Aeronautical Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
United Control Corp.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Waugh Engrg. Co.
Whittaker Controls, Div.-Telecomputing Corp.

Strainers

Aero Supply Mfg. Co., Inc.
Aircraft Porous Media, Inc.
Bendix Aviation Corp., Skinner-Poroloy Div.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Cuno Engrg. Corp., The
Fram Corp.
Harman Equipment Co.
Michigan Wire Cloth Co.
Newark Wire Cloth Co.
Permanent Filter Corp.
Poroloy Equipment, Inc.
Shaw Metal Products Corp.
Winslow Aerofilter Corp.

FUELS, LIQUID

Air Products, Inc.
Allied Chemical & Dye Corp., Nitrogen Div.
American Rocket Co.
Callery Chemical Co.
Escambia Chemical Corp.
Esso Standard Oil Co.
Food Machinery & Chemical Corp.
Food Machinery & Chemical Corp., Ordnance Div.
Herrick L. Johnston, Inc.
*WALLACE O. LEONARD, INC.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Shell Chemical Corp.
Thompson Products, Inc.

FUELS, SOLID

American Rocket Co.
Atlantic Research Corp.
Bios Labs., Inc.
Brush Beryllium Co., The
Callery Chemical Co.
Continental Aviation & Engrg. Corp.
*COOPER DEVELOPMENT CORP.
Escambia Chemical Corp.
B. F. Goodrich Aviation Products
*GRAND CENTRAL ROCKET CO.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Propellex Chemical Corp.
Redstone Arsenal Research Div., Rohm & Haas Co.
Rocketdyne Div., North American Aviation, Inc.
Thompson Products, Inc.
Topper Mfg. Co., Inc.
Turbo Dynamics Corp.

GAS GENERATING DEVICES

Air Products, Inc.
American Potash & Chemical Corp., National Northern Div.
American Rocket Co.
*GRAND CENTRAL ROCKET CO.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
McCormick Selph Associates
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Propellex Chemical Corp.
Reaction Motors, Inc.
Ryan Aeronautical Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Air Products Co.
Talco Engrg. Co., The
Thompson Products, Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

GASES, NITROGEN

Air Products, Inc.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Bios Labs., Inc.
Puritan Compressed Gas Corp., Aviation Div.

GASES, RARE

Air Products, Inc.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Puritan Compressed Gas Corp., Aviation Div.

GASKET PASTE & CEMENT

Samuel Cabot Inc.
Crane Packing Co.
Flexrock Co.
Green, Tweed & Co.
Hamilton Kent Mfg. Co.
Walter K. Jaros, Aircrafters
Parker-Hannifin Corp.
Penn Fibre & Specialty Co., Inc.
Smooth-On Mfg. Co.
United Shoe Machinery Corp.

GASKETS, METALLIC

Acme Mfg. & Gasket Co.
American Brass Co., The
American Welding & Mfg. Co., The
Anchor Packing Co., The
Auburn Mfg. Co., The
Century Fasteners Corp.
D. S. D. Mfg. Co., The
Dumont Aircraft Fitting Co.
Flexrock Co.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
General Gasket Inc.
Green, Tweed & Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kickhaefer Mfg. Co.
*LAMINATED SHIM CO.
Mercury Air Parts Co., Inc.
Metallo Gasket Co.
National Utilities Corp.
Pacific Cut Washer Co.
Penn Fibre & Specialty Co., Inc.
Rodney Metals Inc.
Shielding Inc.
Techniques, Inc.
Tricon Mfg. Co.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.

GASKETS, NON METALLIC

Acme Mfg. & Gasket Co.
Aero Leather Products Co.
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
Anchor Packing Co., The
Armstrong Cork Co.
Auburn Mfg. Co., The

W. H. Brady Co.
Chicago Gasket Co.
Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
Crane Packing Co.
Crystal-X Corp.
Dow Corning Corp.
Dumont Aircraft Fitting Co.
Duroyd Gasket Mfg. Co.
Emerson Plastics Corp.
Enflo Corp.
Excelsior Leather Washer Mfg. Co. Inc.
[illegible]
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
General Gasket Inc.
Green, Tweed & Co.
Halogen Insulator & Seal Corp.
Hamilton Kent Mfg. Co.
Horsey, Robson & Co., Inc.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Jodee Plastics Co.
Kasar Mfg. & Distributing Co., Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Mercury Air Parts Co., Inc.
Metallo Gasket Co.
J. J. Monaghan Co., Inc.
National Utilities Corp.
Neosil Products Co.
Parker-Hannifin Corp.
Penn Fibre & Specialty Co., Inc.
Quick Charge Corp.
Raybestos-Manhattan, Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
Roberts Toledo Rubber Co., The
Rogers Corp.
Rubatex Div., Great American Industries Inc.
Rubbercraft Corp. of California
Seaman Products
Silicone Insulation Inc
M. L. Snyder & Son, Inc.
Sparta Mfg. Co.
Spaulding Fibre Co., Inc.
Synthane Corp.
Union Asbestos & Rubber Co.
U. S. Hammered Piston Ring Co., Inc.
Waldom Electronics Inc.

GAUGES

Atlantic Research Corp.
Barton Instrument Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Ellison Draft Gage Co.
Glassco Instrument Co.
Jas. P. Marsh Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
***ROCHESTER MFG. CO. INC.**

Telectro Industries Corp.

Displacement Measuring

Atlantic Research Corp.
Barton Instrument Corp.
Cleveland Instrument Co.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Northam Electronics, Inc.
Photocon Research Products
Telectro Industries Corp.
Tucson Instrument Corp.
Ultradyne, Inc.
United Control Corp.

Fuel Pressure

Atlantic Research Corp.
Barton Instrument Corp.
Consolidated Controls Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Ellison Draft Gage Co.
Glassco Instrument Co.
Northam Electronics, Inc.
***REPUBLIC MFG. CO.**
***ROCHESTER MFG. CO. INC.**
Scientific Instrument Co.
Servomechanisms, Inc.
Servonic Instruments, Inc.
Stewart-Warner Corp.
Telectro Industries Corp.
Ultradyne, Inc.
U. S. Gauge Div., American Machine & Metals, Inc.

Fuel Quantity

Acoustica Associates, Inc.
Atlantic Research Corp.
Autonetics, Div.-North American Aviation, Inc.
Barton Instrument Corp.
Boston Auto Gage Co., The
Dynametrics Corp.
Liquidometer Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Pioneer-Central Div., Bendix Aviation Corp.
***ROCHESTER MFG. CO. INC.**
Servomechanisms Inc.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
Waugh Engrg. Co.

Hydraulic Pressure

Atlantic Research Corp.
Barton Instrument Corp.
Consolidated Controls Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Glassco Instrument Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Northam Electronics, Inc.
***REPUBLIC MFG. CO.**
***ROCHESTER MFG. CO. INC.**
Scientific Instrument Co.
Servomechanisms, Inc.
Servonic Instruments, Inc.
Ultradyne, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.

Liquid Level

Acoustica Associates, Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aro Equipment Corp., The
Autonetics, Div.-North American Aviation, Inc.
Barton Instrument Corp.
Dynametrics Corp.
Herrick L. Johnston, Inc.
Liquidometer Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Narda Ultrasonics Corp, The
Northam Electronics, Inc.
Phillips Aviation Co.
Pioneer-Central Div., Bendix Aviation Corp.
***REPUBLIC MFG. Co.**
***ROCHESTER MFG. CO. INC.**
Servomechanisms, Inc.
Simmonds Aerocessories, Inc.
Stewart Warner Corp.
Thompson Products, Inc.
Ultradyne, Inc.

Manifold Pressure

Barton Instrument Corp.
Dynamic Instrument Co., Inc.
Glassco Instrument Co.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Servomechanisms, Inc
Servonic Instruments, Inc.
Ultradyne, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.

Oil Level

Acoustica Associates, Inc.
American Electronics, Inc.
Barton Instrument Corp.
Boston Auto Gage Co., The
Electric Auto-Lite Co., The
Liquidometer Corp., The
Northam Electronics, Inc.
***REPUBLIC MFG. CO.**
***ROCHESTER MFG. CO. INC.**
Simmonds Aerocessories, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.

Oil Pressure

American Electronics, Inc.
Barton Instrument Corp.
Consolidated Controls Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Glassco Instrument Co.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Scientific Instrument Co.
Servomechanisms Inc.
U. S. Gauge Div.-American Machine & Metals Inc.

Outside Air Temperature

Cardinal Instrumentation Corp.
Electronic Auto-Lite Co., The
Illinois Testing Laboratories, Inc.
Lewis Engrg. Co., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
***ROCHESTER MFG. CO. INC.**
Rosemount Engrg. Co.
Royco Instruments
Scientific Instrument Co.
Vap-Air Div., Vapor Heating Corp.

Pressure

Consolidated Controls Corp.
W. C. Dillon & Co., Inc.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fischer & Porter Co.
Glassco Instrument Co.
E. Vernon Hill & Co.
Northam Electronics, Inc.
Photocon Research Products
Pioneer-Central Div., Bendix Aviation Corp.
Ronan & Kunzl, Inc.
Scientific Instrument Co.
Servomechanisms Inc.
Stewart-Warner Corp.
Ultradyne, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.

Quantity

Aro Equipment Corp., The
Autonetics, Div.-North American Aviation, Inc.
Dynametrics Corp.
Electric Auto-Lite Co., The
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Liquidometer Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Pioneer-Central Div., Bendix Aviation Corp.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.

GEAR ASSEMBLIES, REDUCTION

Acme Gear Co., Inc.
***ADVANCE GEAR & MACHINE CORP.**
Airborne Accessories Corp.
American Flexible Coupling Div., Zurn Industries, Inc.
American Welding & Mfg. Co., The
Antlab Inc.
Arch Gear Works Inc.
Bowmar Instrument Corp.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Joe Davidson & Associates
Daystrom Instrument Div., Daystrom, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
Ex-Cell-O Corp.
Foote Brothers Gear & Machine Corp.
Geartronics Corp.
General Railway Signal Co.
Globe Industries Inc.
Graflex, Inc.
Grant Gear Works, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hamilton Watch Co., Military Products Div.
Hoover Electric Co.
Hupp Aviation Co.
Insco Co., Div.-Barry Controls Inc.
Instru-lec Corp.
Instruments Corp., The
Kelsey-Hayes Co.
Lear, Inc.
Lovejoy Flexible Coupling Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Mechanical Div.-General Mills, Inc.
O & M Machine Co., Inc.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Philadelphia Gear Works, Inc.
Rae Motor Corp.
Reeves Instrument Corp.
Robot Appliances Inc.
Sier-Bath Gear & Pump Co., Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Technical Oil Tool Corp.
Thompson Products Inc.
***U. S. GEAR CORP.**
Vard Inc.
Vinco Corp.
Waldom Electronics Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.
Zagora Gears, Inc.

GEARS, POWDERED METAL

American Flexible Coupling Div., Zurn Industries, Inc.
Globe Industries Inc.
Invo Spline, Inc.
Keystone Carbon Co.
Licon & Spiroid Divs., Illinois Tool Works
P. R. Mallory & Co. Inc.
Philadelphia Gear Works, Inc.
Sier-Bath Gear & Pump Co., Inc.
Superior Carbon Products, Inc.

GEARS, PRECISION

Acme Gear Co. Inc.

*ADVANCE GEAR & MACHINE CORP.
Allied Plastics Supply Corp.
American Electronics, Inc.
American Flexible Coupling Div., Zurn Industries, Inc.
Amplex Div.-Chrysler Corp.
Arch Gear Works Inc.
Autonetics, Div.-North American Aviation, Inc.
Bergen Carbide Co.
Bowmar Instrument Corp.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Daystrom Instrument Div., Daystrom, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
Foote Brothers Gear & Machine Corp.
Geartronics Corp.
Graflex, Inc.
Grant Gear Works, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hamilton Watch Co., Military Products Div.
Hoover Electric Co.
Hupp Aviation Co.
Instru-Lec Corp.
Invo Spline, Inc.
Kelsey-Hayes Co.
H. Koch & Sons
*LAVEZZI MACHINE WORKS
Librascope Inc.
Licon & Spiroid Divs., Illinois Tool Works
*LYCOMING DIV., AVCO MFG. CORP.
Lyndon Aircraft, Inc.
Mechanical Div.-General Mills, Inc.
W. H. Nichols Co.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Philadelphia Gear Works, Inc.
Reeves Instrument Corp.
Research Development Mfg. Inc.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Sier-Bath Gear & Pump Co., Inc.
Herman D. Steel Co.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Technical Oil Tool Corp.
Thompson Products, Inc.
*U. S. GEAR CORP.
Vard Inc.
Vinco Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.
Zagora Gears, Inc.

GEARS, RADIO & INSTRUMENT

Acme Gear Co., Inc.
Arch Gear Works Inc.
Bowmar Instrument Corp.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Daystrom Instrument Div., Daystrom, Inc.
G. M. Dykes Iron Works, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Exact Engrg. & Mfg. Inc.
Geartronics Corp.
Grant Gear Works, Inc.
Hamilton Watch Co., Military Products Div.
Instruments Corp., The
*LAVEZZI MACHINE WORKS
Librascope Inc.
Licon & Spiroid Divs., Illinois Tool Works
Lyndon Aircraft, Inc.
Mechanical Div.-General Mills, Inc.
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Reeves Instrument Corp.
Research Development Mfg. Inc.
Sier-Bath Gear & Pump Co., Inc.
Stewart-Warner Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
*U. S. GEAR CORP.
Waldom Electronics Inc.
Zagora Gears, Inc.

GENERATORS

Alto Scientific Co., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Eicor Div.-F. L. Jacobs Co.
Electric Indicator Co. Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Hertner Electric Co., The
Instruments Corp., The
*INTERELECTRONICS CORP.
Jack & Heintz, Inc.
Kurz & Root Co.
Leland Electric Co., The, Div.-American Machine & Foundry Co.
D. W. Onan & Sons Inc.
Philadelphia Gear Works, Inc.
Milton Roy Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Talley Corp., The
Trindl Products, Ltd.
Varo Mfg. Co.
Wincharger Corp.

Electric a.c.

Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Welding & Mfg. Co., The
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Indicator Co., Inc.
Electric Products Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hertner Electric Co., The
Hoover Electric Co.
Instruments Corp., The
*INTERELECTRONICS CORP.
Jack & Heintz, Inc.
Kurz & Root Co.
Leland Electric Co., The, Div.-American Machine & Foundry Co.
*MOTOR GENERATOR CORP.
Motoresearch Co.
D. W. Onan & Sons Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Philco Corp., Government & Industrial Divs.
Redmond Co., Inc.
Servomechanisms, Inc.
Small Motors Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Talley Corp., The
Task Corp.
Telectro Industries Corp.
Varo Mfg. Co.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wincharger Corp.

Electric d.c.

Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Welding & Mfg. Co., The
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Indicator Co. Inc.
Electric Products Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gray & Huleguard, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hertner Electric Co., The
Hoover Electric Co.
Instruments Corp., The
*INTERELECTRONICS CORP.
Jack & Heintz, Inc.
*MOTOR GENERATOR CORP.
Motoresearch Co.
D. W. Onan & Sons Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Redmond Co., Inc.
Servomechanisms, Inc.
Small Motors Inc.
Solar Aircraft Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Talley Corp., The
Telectro Industries Corp.
Varo Mfg. Co.
Westinghouse Electric Corp.
Wincharger Corp.

Engine Driven

Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
*AMERICAN MACHINE & FOUNDRY CO.
American Welding & Mfg. Co., The
Barker Sales Co.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Joe Davidson & Associates
Detroit Diesel Engine Div.-General Motors Corp.
Eicor Div.-F. L. Jacobs Co.
Electric Products Co., The
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Georator Corp.
Hammett Electric Co.
Instruments Corp., The
International Fermont Machinery Co., The
Jack & Heintz, Inc.
Leland Electric Co., The, Div.-American Machine & Foundry Co.
*MOTOR GENERATOR CORP.
Motorsearch Co.
D. W. Onan & Sons Inc.
Ready Power Co., The
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.
Wincharger Corp.

Frequency

Alto Scientific Co., Inc.
American Electronics, Inc.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
Joe Davidson & Associates
Dunlap Electronics, Inc.
Eicor Div.-F. L. Jacobs Co.
Erie Resistor Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gray & Huleguard, Inc.
Hammett Electric Co.
Instruments Corp., The
*INTERELECTRONICS CORP.
Kay Electric Co.
Lampkin Labs., Inc.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
*MOTOR GENERATOR CORP.
Motoresearch Co.
Potter Aeronautical Corp.
Resdel Engrg. Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Varo Mfg. Co.
Wacline, Inc.

Function

Consolidated Avionics Corp.
Diehl Mfg. Co.
*INTERELECTRONICS CORP.
Philco Corp., Government & Industrial Divs.
Servomechanisms, Inc.
Telectro Industries Corp.

Hand Driven

Telectro Industries Corp.
Wincharger Corp.

High Frequency Power

Acoustica Associates, Inc.
Bogue Electric Mfg. Co.
D & R, Ltd.
Joe Davidson & Associates
Electric Products Co., The
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gray & Huleguard, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Kurz & Root Co.
Leland Electric Co., The, Div.-American Machine & Foundry Co.
Lindberg Engrg. Co.
Motoresearch Co.
Philco Corp., Government & Industrial Divs.
Resdel Engrg. Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Thompson Products, Inc.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.

Liquid Oxygen

Air Products, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Herrick L. Johnston, Inc.
Superior Air Products Co.

Liquid Oxygen, Mobile

Air Products, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Herrick L. Johnston, Inc.

Motor

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
*AMERICAN MACHINE & FOUNDRY CO.

. . . propulsion system

American Welding & Mfg. Co., The
Barker Sales Co.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Cedar Engrg. Div.-Control Data Corp.
D & R, Ltd.
Diehl Mfg. Co.
Eastern Air Devices, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Eicor Div.-F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Indicator Co. Inc.
Electric Products Co., The
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Gray & Huleguard, Inc.
Hammett Electric Co.
Helipot Corp.
Hertner Electric Co., The
Hoover Electric Co.
***INTERELECTRONICS CORP.**
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Kurz & Root Co.
Motordyne Inc.
Motoresearch Co.
Small Motors Inc.
Talley Corp., The
Task Corp.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**

Pulse

American Electronic Labs., Inc.
American Electronics, Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
***INTERELECTRONICS CORP.**
Kay Electric Co.
Lavoie Labs., Inc.
Manson Laboratories, Inc.
Resdel Engrg. Corp.
Milton Roy Co.
Rutherford Electronics Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Sync

American Electronics, Inc.
Bogue Electric Mfg. Co.
Cedar Engrg. Div.-Control Data Corp.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Hammett Electric Co.
***INTERELECTRONICS CORP.**
Kurz & Root Co.
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.

Tachometer

American Electronics, Inc.
Barber-Colman Co.
Bogue Electric Mfg. Co.
***COOPER DEVELOPMENT CORP.**
D & R, Ltd.
Joe Davidson & Associates
Diehl Mfg. Co.
Eastern Air Devices, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Electric Indicator Co. Inc.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gray & Huleguard, Inc.
Instruments Corp., The
Jack & Heintz, Inc.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Motordyne Inc.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Potter Aeronautical Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Small Motors Inc.
Telectro Industries Corp.
Thompson Products Inc.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

GENERATORS, ELECTRONIC

Advance Industries, Inc.
Alto Scientific Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
BJ Electronics, Borg-Warner Corp.
Consolidated Avionics Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Communication Co.
***INTERELECTRONICS CORP.**
***KAHN & CO., INC.**
Kay Electric Co.
Reeve Electronics, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.

Am-Fm

Advance Industries, Inc.
Bendix Aviation Corp., York Div.
Dunlap Electronics, Inc.
***INTERELECTRONICS CORP.**
La Pointe Industries Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Harmonic Frequency

Advance Industries, Inc.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Dunlap Electronics, Inc.
Graflex, Inc.
***INTERELECTRONICS CORP.**
Kay Electric Co.
La Pointe Industries Inc.
Manson Laboratories, Inc.
Resdel Engrg. Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Telonic Industries Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.

Microwave

Airborne Instruments Lab., Inc.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Dunlap Electronics, Inc.
Geisler Labs.
General Communication Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kay Electric Co.
La Pointe Industries Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Resdel Engrg. Corp.
Saratoga Industries
Telechrome Mfg. Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.
Wave Particle Corp.

Noise

Airborne Instruments Lab., Inc.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Geisler Labs.
General Sound Control, Inc.
Kay Electric Co.
La Pointe Industries Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Saratoga Industries
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wave Particle Corp.
Western Electro-Acoustic Lab.

Picture Signal

Dunlap Electronics, Inc.
Kay Electric Co.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.

Pulse

Advance Industries, Inc.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Briggs Associates, Inc.
Consolidated Avionics Corp.
Demornay-Bonardi
Dunlap Electronics, Inc.
Erie Resistor Corp.
General Communication Co.
La Pointe Industries Inc.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Potter Aeronautical Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Rutherford Electronics Co.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Square Wave

Alto Scientific Co., Inc.
Antlab Inc.
BJ Electronics, Borg-Warner Corp.
Briggs Associates, Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Electronic Measurements Corp.
Engineered Magnetics, Div.-Gulton Industries, Inc.
General Communication Co.
***INTERELECTRONICS CORP.**
Kay Electric Co.
Motordyne Inc.
Resdel Engrg. Corp.
Rutherford Electronics Co.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Ultradyne, Inc.
Varo Mfg. Co.

Signal, A-F

Alto Scientific Co., Inc.
Dunlap Electronics, Inc.
Elm Mfg. Co. Inc.
Erwood Inc.
Kay Electric Co.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Signal, F-M

Advance Industries, Inc.
Dunlap Electronics, Inc.
Electronic Measurements Corp.
General Instrument Corp., Defense Products Div.
Kay Electric Co.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.

Signal, R-F

Airborne Instruments Lab., Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Ferris Instrument Co.
General Communication Co.
General Instrument Corp., Defense Products Div.
Kay Electric Co.
Lavoie Labs., Inc.
Manson Laboratories, Inc.
Resdel Engrg. Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Signal, SHF

Geisler Labs.
General Communication Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wave Particle Corp.

Signal, Single Sideband

Ferris Instrument Co.
General Instrument Corp., Defense Products Div.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kay Electric Co.
Manson Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Signal, Sweeping

BJ Electronics, Borg-Warner Corp.
Geisler Labs.
Gerard G. Leeds Co., Inc.

Panoramic Radio Products, Inc.
Philco Corp., Government & Industrial Divs.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wave Particle Corp.

Signal, Television Synchronizing

Kay Electric Co.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Thompson Products, Inc.

Signal, UHF or VHF

BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
***COOPER DEVELOPMENT CORP.**
Ferris Instrument Co.
General Instrument Corp., Defense Products Div.
Manson Laboratories, Inc.
Saratoga Industries
Simpson Electric Co.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Ultrasonic

Acoustica Associates, Inc.
Alcar Instruments, Inc.
Blackstone Corp.
Branson Instruments, Inc.
Joe Davidson & Associates
General Nuclear Corp.
Gulton Industries, Inc.
***INTERELECTRONICS CORP.**
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Massa Labs., Inc.
Narda Ultrasonics Corp., The
Piezo Products Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Variable Frequency

Airborne Instruments Lab., Inc.
American Electronics, Inc.
Joe Davidson & Associates
Erwood Inc.
Geisler Labs.
***INTERELECTRONICS CORP.**
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Resdel Engrg. Corp.
Servo Corp. of America
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Wave Particle Corp.

Waveform

Airborne Instruments Lab., Inc.
Consolidated Avionics Corp.
***INTERELECTRONICS CORP.**
George A. Philbrick Researches, Inc.
Resdel Engrg. Corp.
Rutherford Electronics Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telechrome Mfg. Corp.
Ultradyne, Inc.

GLASS INSULATION

Allied Plastics Supply Corp.
Semon Bache & Co.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Corning Glass Works
Duracote Corp.
Eagle-Picher Co., The
Hastings Plastics Inc.
L. O. F. Glass Fibers Co.
Seaman Products
Solar Aircraft Co.
H. I. Thompson Fiber Glass Co.
Union Asbestos & Rubber Co.
Varflex Corp.
Warren Wire Co.

GLASS, MICA-WOVEN OR LAMINATED

Allied Plastics Supply Corp.
Semon Bache & Co.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fiber Corp., Sub.-The Budd Co.
Hastings Plastics Inc.
Lamtex Industries, Inc.
Magnetic Shield Div.-Perfection Mica Co.
New England Laminates Co., Inc.
St. Regis Paper Co.
Silicones Div.-Union Carbide Corp.
Stevens Products, Inc.
Swedlow Plastics Co.
Warren Wire Co.

GOVERNORS, MISSILE CONTROL

Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hoof Products Co.
Menasco Mfg. Co.
Thompson Products, Inc.
Varo Mfg. Co.

GRAIN, ALUNDUM

Morganite, Inc.
Norton Co.

GRAPHITE, COLLOIDAL

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Bios Labs., Inc.
Grafo Colloids Corp.

GRAPHITE, LUBRICATING

Bios Labs., Inc.
Carbone Corp., The
Drilube Co.
Electrofilm, Inc.
Grafo Colloids Corp.
Kano Labs.

GREASES, VACUUM

Alpha-Molykote Corp.
Bios Labs., Inc.
Consolidated Electrodynamics Corp.
Silicones Div.-Union Carbide Corp.
Veeco Vacuum Corp.

HARNESSES, IGNITION

ACF Industries, Inc., Advanced Products Div.
Aerodex, Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airtron, Inc.
Beaton & Corbin Mfg. Co., The
Belden Mfg. Co.
Coaxial Connector Co., Inc.
Co-Operative Industries, Inc.
Dayton Aircraft Products, Inc.
Electric Auto-Lite Co., The
First Electronics Corp., The
Flexible Metal Hose Mfg. Co.
General Laboratory Associates, Inc.
Goodyear Aircraft Corp.
Hallett Mfg. Co.
Hammett Electric Co.
Illumitronic Engrg. Co.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
Kilgen- Aircraft Div.-The Kilgen Organ Co.
La Pointe Industries, Inc.
J. E. Menaugh Co.
New England Tape Co., Inc.
Packard Electric Div.-General Motors Corp.
Republic Aviation Corp., Guided Missiles Div.
Rowe Industries
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Skytronics
Titeflex, Inc.
Transvision, Inc.

HARNESSES, THERMOCOUPLES

Advanced Electronics, Inc.
Aero Research Instrument Co. Inc.
Airtron, Inc.
B G Corp., The
Beaton & Corbin Mfg. Co., The
Coaxial Connector Co. Inc.
Fenwal, Inc.
First Electronics Corp., The
Hallett Mfg. Co.
Hammett Electric Co.
Harco Labs., Inc.
Illinois Testing Laboratories, Inc.
International Electric Industries, Inc.
Kerns Mfg. Corp.
La Pointe Industries, Inc.
Lewis Engrg. Co., The
Republic Aviation Corp., Guided Missiles Div.
Royco Instruments
Scintilla Div., Bendix Aviation Corp.
T-C Div., Dyna-Empire, Inc.
Telectro Industries Corp.
Thermo Electric Co., Inc.
Titeflex, Inc.
Transvision, Inc.

HARNESSES, WIRE

ACF Industries, Inc., Advanced Products Div.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alden Products Co.
Allied Plastics Supply Corp.
Alpha Wire Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
American Super-Temperature Wires, Inc.
Anchor Specialty Mfg. Co. Inc.
Beaton & Corbin Mfg. Co., The
Belden Mfg. Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Cambridge Wire Cloth Co., The
Coaxial Connector Co. Inc.
***COOPER DEVELOPMENT CORP.**
Co-Operative Industries, Inc.
Dale Products, Inc.
Dayton Aircraft Products, Inc.
Dwyer Engrg. Co., Inc.
Elco Corp.
Electric Auto-Lite Co., The
Electric Parts Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Empire Electronics Co., Inc.
Essex Mfg. Co., Inc.
First Electronics Corp., The
General Laboratory Associates, Inc.
General Railway Signal Co.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Gunnar Laboratories
Hallett Mfg. Co.
Hammett Electric Co.
Harco Labs., Inc.
Highland Engrg. Co.
Hoover Electronics Co.
Illumitronic Engrg. Co.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
***KAHN & CO., INC.**
Kickhaefer Mfg. Co.
Kulka Electric Corp.
La Pointe Industries Inc.
Lewis Engrg. Co., The
Lumen, Inc.
Lytle Engrg. & Mfg. Co.
Manger Electric Co.
Missile Engrg. Products, Inc.
J. J. Monaghan Co., Inc.
North Electric Co.
Packard Electric Div.-General Motors Corp.
Philco Corp., Government & Industrial Divs.
Progressive Research & Development Co., Inc.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Rowe Industries
Schaffer Air Industries, Inc.
Scintilla Div., Bendix Aviation Corp.
Sheltered Workshop
Superex Electronics Corp.
Suprenant Mfg. Co.
T-C Div., Dyna-Empire, Inc.
Technical Oil Tool Corp.
Titeflex, Inc.
Topper Mfg. Co., Inc.
Transvision, Inc.
Tucson Instrument Corp.
Warren Wire Co.
Western International Co.
Wickfield, Inc.
Winder Aircraft Corp. of Fla.
Zippertubing Co., The

HEADERS

Electronic Techniques, Inc.
Garde Mfg. Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Republic Aviation Corp., Guided Missiles Div.
Solar Aircraft Co.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America

HEAT EXCHANGERS, EXHAUST

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Research & Mfg. Corp.
American Welding & Mfg. Co., The
Cromer Mfg. & Engrg., Inc.
Dunham-Bush Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Griscom-Russell Co., The
Hupp Aviation Co.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
***LYCOMING DIV., AVCO MFG. CORP.**
Ryan Aeronautical Co.
Solar Aircraft Co.
Trane Co., The
***UNITED AIRCRAFT PRODUCTS, INC.**

HEAT TRANSFER CONTROL SYSTEMS

American Research & Mfg. Corp.
Applied Dynamics Corp.
[illegible] Control Labs., Inc
CDC Control Services, Inc.
Consolidated Controls Corp.
***EASTERN INDUSTRIES, INC.**
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Herrick L. Johnston, Inc.
Joseph Kaye & Co.
***RYAN INDUSTRIES**
Solar Aircraft Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
Vap-Air Div., Vapor Heating Corp.

HEATER MUFFLER ASSEMBLIES

Associated Co., Inc.
General Sound Control, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Joseph Kaye & Co.
Ryan Aeronautical Co.
Solar Aircraft Co.

HEATERS

Acme Electric Heating Co.
Auto-Control Labs., Inc.
Cutler-Hammer Inc.
Dampp-Chaser, Inc.
Electric Parts Corp.
Electrofilm, Inc.
Electro-Flex Heat, Inc.
Electromode, Div.-Commercial Controls Corp.
B. F. Goodrich Aviation Products
Hammett Electric Co.
Herla Engrg. Corp.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Joseph Kaye & Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Miskella Infra-Red Co., The
***RYAN INDUSTRIES**
Safeway Heat Elements, Inc.
Trane Co., The
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.

HEATING, ELECTRONIC

Electrofilm, Inc.
Erdco Engrg. Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Joseph Kaye & Co.
Resdel Engrg. Corp.
Telectro Industries Corp.
***WESTINGHOUSE ELECTRIC CORP.**

HEATING, ELECTRONIC, INDUCTION

Auto-Control Labs., Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Erdco Engrg. Corp.
Flexaust Co., The
Hammett Electric Co.
Lindberg Engrg. Co.
Telectro Industries Corp.
United Supply Co.
***WESTINGHOUSE ELECTRIC CORP.**

HOSE, AIR

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., The
American Brass Co., American Metal Hose Div.
Anchor Coupling Co. Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Continental Rubber Works
Co-Operative Industries, Inc.
Devilbiss Co., The
Electric Hose & Rubber Co.
Flexaust Co., The
Flexonics Corp.
B. F. Goodrich Aviation Products
Gray Co., Inc.
Hewitt-Robins, Inc.
Imperial Brass Mfg. Co., The
Parker-Hannifin Corp.
Quaker Rubber Div.-H. K. Porter Co., Inc.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
M. L. Snyder & Son, Inc.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Stewart-Warner Corp.
Stratoflex, Inc.
United Supply Co.
Weatherhead Co., The

HOSE, FLEXIBLE, METALLIC

Allied Plastics Supply Corp.
American Brass Co., The
American Brass Co., American Metal Hose Div.
Arrowhead Products Div.—Federal Mogul-Bower Bearings, Inc.
Atlantic Metal Hose Co. Inc.
Avica Corp.
Beaton & Corbin Mfg. Co., The
Chiksan Co.
Consolidated American Services, Inc.
Co-Operative Industries, Inc.
D K Mfg. Co.
Electric Hose & Rubber Co.
Federal Metal Hose Corp.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
Rodney Metals Inc.
Ronan & Kunzl Inc., Cryogenic Div.
Servicair Co.
Stainless Steel Products, Inc.
Titeflex, Inc.
Tube Distributors Co., Inc.

HOSE, FLEXIBLE, NON METALLIC

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Birnbach Radio Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
C. R. Daniels, Inc.
Electric Hose & Rubber Co.
Flexonics Corp.
B. F. Goodrich Aviation Products
Harman Equipment Co.
Hewitt-Robins, Inc.
Imperial Brass Mfg. Co., The
Joclin Mfg. Co.
Parker-Hannifin Corp.
Pyles Industries Inc.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
M. L. Snyder & Son, Inc.
Sparta Mfg. Co.
Stainless Steel Products, Inc.
Stratoflex, Inc.
Surprenant Mfg. Co.
Titeflex, Inc.
United Supply Co.
Weatherhead Co., The

HOSE, HYDRAULIC

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Anchor-Coupling Co. Inc.
Beaton & Corbin Mfg. Co., The
Chiksan Co.
Continental Rubber Works
***COOPER DEVELOPMENT CORP.**
Electric Hose & Rubber Co.
Flexonics Corp.
B. F. Goodrich Aviation Products
Gray Co., Inc.
Hewitt-Robins, Inc.
Imperial Brass Mfg. Co., The
Parker-Hannifin Corp.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
Stainless Steel Products, Inc.
Stewart Warner Corp.
Stratoflex, Inc.
Titeflex, Inc.
Weatherhead Co., The

HYDRAULIC RESERVOIRS

ACF Industries, Inc., Advanced Products Div.
***AMERICAN MACHINE & FOUNDRY CO.**
American Tool Co.
Applied Dynamics Corp.
Arkwin Industries, Inc.
Bridgwater Machine Co.
Champion Airquipment Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
***COOPER DEVELOPMENT CORP.**
***CORNELIUS CO., THE**
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
***DIVERSEY ENGRG. CO.**
***ELECTROL INC.**
G. W. Galloway Co.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Hydra-Power Corp.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Pressed Steel Tank Co.
Ryan Aeronautical Co.
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
***VALCOR ENGRG. CORP.**
Vickers Inc., Div.-Sperry Rand
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weatherhead Co., The
Wells Industries Corp.

HYDRAULIC SYSTEMS & CONTROLS

Accessory Controls & Equipment Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aerotec Corp., The
Airborne Research & Development Corp.
Applied Dynamics Corp.
Arkwin Industries, Inc.
Auto-Control Labs., Inc.
Autonetics, Div.-North American Aviation, Inc.
Bridgwater Machine Co.
CDC Control Services, Inc.
Cadillac Gage Co.
Calcor Corp., Aircraft Div.
Champion Airquipment Inc.
Clary Dynamics
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
***COMMERCIAL SHEARING & STAMPING CO.**
Consolidated Controls Corp.
***CORNELIUS CO., THE**
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Devco Engrg. Inc.
***DIVERSEY ENGRG. CO.**
***EASTERN INDUSTRIES, INC.**
Eddington Metal Specialty Co.
***ELECTROL INC.**
Engelberg Huller Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Futurecraft Corp.
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Controls Co.
Gray & Huleguard, Inc.
Hagan Chemicals & Controls, Inc.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Walter J. Hyatt Co., The
Hydra-Power Corp.
***KAHN & CO., INC.**
Kelsey-Hayes Co.
Kearfott Co., Inc.
Kemp Aero Products, Div.-Kemp Inc.
La Pointe Industries Inc.
***VALCOR ENGRG. CO.**
***WALLACE O. LEONARD, INC.**
Loewy-Hydropress Div.—Baldwin-Lima-Hamilton
Lyndon Aircraft, Inc
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
New York Air Brake Co., The, Watertown Div.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parameters, Inc.
Parker Aircraft Co.
Pesco Products Div.—Borg-Warner Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reeves Instrument Corp.
***REPUBLIC MFG. CO.**
Research Controls
Ryan Aeronautical Co.
A. U. Stone & Co., Inc.
Sundstrand Aviation Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div.-Sundstrand Machine Tool Co.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
Trimount Instrument Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Weston Hydraulics, Ltd.

IGNITION ASSEMBLIES

American Electric Cable Co.
Atlantic Research Corp.
Auburn Spark Plug Co., Inc.
Beaton & Corbin Mfg. Co., The
Co-Operative Industries, Inc.
Dayton Aircraft Products, Inc.
Electric Auto-Lite Co., The
First Electronics Corp., The
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
General Laboratory Associates, Inc.
***GRAND CENTRAL ROCKET CO.**
Hallett Mfg. Co.
International Electric Industries, Inc.
Kilgore, Inc., International Flare-Signal Div.
Marquardt Aircraft Co.
McCormick Selph Associates
Modelectric Products Corp.
Packard Electric Div.-General Motors Corp.
Redstone Arsenal Research Div., Rohm & Haas Co.
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Skytronics
Telectro Industries Corp.
Titeflex, Inc.

IGNITION TUBE ASSEMBLIES

Beaton & Corbin Mfg. Co., The

Co-Operative Industries, Inc.
General Laboratory Associates, Inc.
Hallett Mfg. Co.
International Electric Industries, Inc.
National Airoil Burner Co.
Resdel Corp.
Scintilla Div., Bendix Aviation Corp.

IGNITION SHIELDINGS

American Electric Cable Co.
Birnbach Radio Co., Inc.
Co-Operative Industries, Inc.
Flexible Metal Hose Mfg. Co.
General Cable Corp.
General Laboratory Associates, Inc.
Hallett Mfg. Co.
J. E. Menaugh Co.
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Titeflex, Inc.
Zippertubing Co., The

IGNITION SYSTEMS, AIRBORNE

Atlantic Research Corp.
Carleton Aviation Co., Inc.
Co-Operative Industries, Inc.
Electric Auto-Lite Co., The
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
General Laboratory Associates, Inc.
International Electric Industries, Inc.
Marquardt Aircraft Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Packard Electric Div.-General Motors Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Reaction Motors, Inc.
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Skytronics
Telectro Industries Corp.
Titeflex, Inc.
United Aircraft Products, Inc.

IGNITION SYSTEMS, ELECTRONIC

American Electric Cable Co.
Atlantic Research Corp.
Co-Operative Industries, Inc.
Electric Auto-Lite Co., The
General Laboratory Associates, Inc.
Hammett Electric Co.
International Electric Industries, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.
Titeflex, Inc.

IMPELLERS

Aluminum Co. of America
Morris Bean & Co.
Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Enflo Corp.
Globe Industries, Inc.
Herlo Engrg. Corp.
Kelsey-Hayes Co.
Kemp, Inc.
Kerns Mfg. Corp.
***LYCOMING DIV., AVCO MFG. CORP.**
Parker-Hartford Corp., The
Stratos, Div.-Fairchild Engine & Airplane Corp.
Thompson Products, Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

INDICATORS

Allegheny Instrument Co., Inc.
***R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.**
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Humphrey, Inc.
***KAHN & CO., Inc.**
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Reflectone Corp., The
Systron Corp.
Telectro Industries Corp.
Thermo Electric Co., Inc.
Wacline, Inc.

Rate-of-Roll

Analogue Controls, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Humphrey, Inc.
Kearfott Co., Inc.
***WALLACE O. LEONARD, INC.**
Minneapolis-Honeywell Regulator Co., Boston Div.
Systron Corp.
Ultradyne, Inc.
Wave Particle Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Rate-of-Yaw

***R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INDUSTRIES DIV.**
Analogue Controls, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Kearfott Co., Inc.
***WALLACE O. LEONARD, INC.**
Minneapolis-Honeywell Regulator Co., Boston Div.
Wave Particle Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Recording Engine

Air Logistics Corp.
***GARRETT CORP, THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
Minneapolis-Honeywell Regulator Co., Indust. Div.

RF Probe

Demornay-Bonardi
Geisler Labs.
Hallamore Electronics Co.
Kay Electric Co.
Narda Microwave Corp., The
Uniwave, Inc.
Wave Particle Corp.
Western International Co.

Smoke & Combustion, Electronic

Electric Eye Equipment Co.
Electronic Control Corp.
Electronics Corp. of America
Ess Instrument Co.
General Electric Co., Apparatus Sales Div.

Sound Level

Air Logistics Corp.
Chesapeake Instrument Corp.
Impact-O-Graph Corp., The
Kay Electric Co.
Photocon Research Products
Telectro Industries Corp.

Specific Gravity

Fischer & Porter Co.
General Scientific Equipment Co.
Liquidometer Corp., The
Potter Aeronautical Corp.

Strain

B & F Instruments, Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Cal-Ohm Labs., Inc.
Clark Electronic Laboratories
Columbia Research Labs.
Consolidated Avionics Corp.
Dynamic Instrument Co., Inc.
Fenwal Inc.
General Electric Co., Apparatus Sales Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Telectro Industries Corp.
Ultradyne, Inc.
Victory Engineering Corp.

Temperature

Allegany Instrument Co., Inc.
Assembly Products, Inc.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
B & H Instrument Co., Inc.
Cardinal Instrumentation Corp.
Clark Electronic Laboratories
Consolidated Avionics Corp.
Consolidated Controls Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
General Scientific Equipment Co.
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
North Atlantic Industries, Inc.
***KAHN & CO., INC.**
Walter Kidde & Co., Inc., Aviation Div.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Liquidometer Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Palmer Thermometers, Inc.
Papesch & Kolstad, Inc.
Piezo Products Co.
Powers Regulator Co., The
Pyrometer Instrument Co., Inc.
Royco Instruments
Stewart-Warner Corp.
Telectro Industries Corp.
Tempil Corp.
Thermo Electric Co., Inc.

Thrust

Allegany Instrument Co., Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Clark Electronic Laboratories
Columbia Research Labs.
Consolidated Avionics Corp.
Consolidated Controls Corp.
Dynametrics Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Ulytradyne, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.

Torque

B & F Instruments, Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Consolidated Avionics Corp.
Consolidated Controls Corp.
Joe Davidson & Associates
Dynametrics Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Electric Co., Apparatus Sales Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
U. S. Gauge Div.-American Machine & Metals, Inc.

INJECTION SYSTEMS, FUEL

Aero Supply Mfg. Co., Inc.
American Brass Co., The
Arma Div.-American Bosch Arma Corp.
Bendix Products Div., Bendix Aviation Corp.
California Aircraft Products
Eddington Metal Specialty Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engineered Products Co., The
Ex-Cell-O Corp.
Fulton-Irgon Corp., The
Walter J. Hyatt Co., The
Marquardt Aircraft Co.
National Airoil Burner Co.
Parker Aircraft Co.
Reaction Motors, Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
***VALCOR ENGRG. CORP.**
Veet Industries
Wright Aeronautical Div., Curtiss-Wright Corp.

INJECTION SYSTEMS, WATER

Bendix Products Div., Bendix Aviation Corp.
Eddington Metal Specialty Co.
Engineered Products Co., The
National Airoil Burner Co.
Parker Aircraft Co.
***VALCOR ENGRG. CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

INSULATION MATERIALS

Air Products, Inc.
Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Birnbach Radio Co., Inc.
Duracote Corp.
Eagle-Picher Co., The
Electronic Mechanics, Inc.
Emerson Plastics Corp.
Flock Process Co. Inc.
General Electric Co., Apparatus Sales Div.
Joseph Kaye & Co.
Keystone Electronics Corp.
L. O. F. Glass Fibers Co.
Maryland Lava Co.
Norton Co.
Rubatex Div., Great American Industries Inc.

St. Regis Paper Co.
[illegible]ducts
Silicone Insulation, Inc.
[illegible] Div.-Union Carbide Corp.
D. M. Steward Mfg. Co.
Swedlow Plastics Co.
Synthane Corp.
Topper Mfg. Co., Inc.
Union Asbestos & Rubber Co.
Zirconium Corp. of America

Asbestos

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp. Sub.—The Budd Co.
Eagle-Picher Co., The
Emerson Plastics Corp.
General Electric Co., Apparatus Sales Div.
General Plastics Corp. of New Jersey
Raybestos-Manhattan, Inc.
Rogers Corp.
Silicone Insulation, Inc.
Swedlow Plastics Co.
Union Asbestos & Rubber Co.

Ceramic

Allied Plastics Supply Corp.
American Lava Corp.
Auburn Spark Plug Co., Inc.
B G Corp., The
*COOPER DEVELOPMENT CORP.
Corning Glass Works
Diamonite Products Mfg. Co.
Wilbur B. Driver Co.
Du-Co Ceramics Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Emerson & Cuming, Inc.
Erie Resistor Corp.
General Ceramics Corp.
General Instrument Corp., Defense Products Div.
Isolantite Mfg. Corp.
Linde Co., Div.-Union Carbide Corp.
Maryland Lava Co.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
Norton Co.
Rogers Corp.
Skytronics
Solar Aircraft Co.
D. M. Steward Mfg. Co.
Swedlow Plastics Co.
Thermo Materials, Inc.
Topper Mfg. Co., Inc.
Western Gold & Platinum
*WESTINGHOUSE ELECTRIC CORP.
Zirconium Corp. of America

Glass

Allied Plastics Supply Corp.
Continental Diamond Fibre Corp. Sub.—The Budd Co.
Duracote Corp.
L. O. F. Glass Fibers Co.
Lamtex Industries, Inc.
Mycalex Corp. of America
Silicone Insulation, Inc.
Solar Aircraft Co.
Swedlow Plastics Co.
Union Asbestos & Rubber Co.
Varflex Corp.

Glass Fibre

Aero Leather Products Co.
Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Bar-Ray Products, Inc.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Eagle-Picher Co., The
Emerson & Cuming, Inc.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
General Electric Co., Apparatus Sales Div.
Hastings Plastics Inc.
L. O. F. Glass Fibers Co.
Lamtex Industries, Inc.
St. Regis Paper Co.
Seaman Products
Silicone Insulation, Inc.
Swedlow Plastics Co.
Synthane Corp.
H. I. Thompson Fiber Glass Co.
Union Asbestos & Rubber Co.
Varflex Corp.

Nylon

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
William Brand & Co., Inc.
*BROOK MOLDING CORP.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Emerson Plastics Corp.
Engineered Plastics, Inc.
Franklin Fibre-Lamitex Corp.
General Plastics Corp. of New Jersey
General Electric Co., Apparatus Sales Div.
Jodee Plastics Co.
Penn Fibre & Specialty Co., Inc.
St. Regis Paper Co.
Swedlow Plastics Co.
Synthane Corp.
Varflex Corp.

Paper

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Franklin Fibre-Lamitex Corp.
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
St. Regis Paper Co.
Swedlow Plastics Co.
Synthane Corp.

Silicone Compounds

Allied Plastics Supply Co.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Bacon Industries, Inc.
Biwax Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electronic Mechanics, Inc.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
General Electric Co., Apparatus Sales Div.
Industrial Mica Corp.
Pacific Moulded Products Co.
Silicone Insulation, Inc.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Solar Aircraft Co.
Swedlow Plastics Co.
Synthane Corp.
Varflex Corp.

INSULATION PARTS

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
N. S. Baer Co.
Birnbach Radio Co., Inc.
Diamonite Products Mfg. Co.
Electronic Mechanics, Inc.
Emerson Plastics Corp.
Enflo Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Franklin Fibre-Lamitex Corp.
Gatke Corp.
General Gasket Inc.
Goodyear Aircraft Corp.
Herlo-Engrg. Corp.
Walter Lee Chemical Corp.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Mycalex Corp. of America
Peerless Products Industries
Rogers Corp.
Ryan Aeronautical Co.
Saxonburg Ceramics
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
D. M. Steward Mfg. Co.
Swedlow Plastics Co.
Synthane Corp.
Warren Wire Co.
Westlake Plastics, CrystalX Corp.
Zirconium Corp. of America

Ceramic Insulation Parts

Allied Plastics Supply Corp.
American Lava Corp.
Auburn Spark Plug Co., Inc.
B G Corp., The
*COOPER DEVELOPMENT CORP.
Corning Glass Works
Diamonite Products Mfg. Co.
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Erie Resistor Corp.
General Ceramics Corp.
General Instrument Corp., Defense Products Div.
Isolantite Mfg. Corp.
Lapp Insulator Co., Inc. Radio Specialties Div.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
Norton Co.
Rogers Corp.
Saxonburg Ceramics
Skytronics
Solar Aircraft Co.
D. M. Steward Mfg. Co.
Swedlow Plastics Co.
Thermo Materials, Inc.
Western Gold & Platinum
*WESTINGHOUSE ELECTRIC CORP.
Zirconium Corp. of America

Insulating Sleeves

Allied Plastics Supply Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Birnbach Radio Co., Inc.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Crystal-X Corp.
Diamonite Products Mfg. Co.
Wilbur B. Driver Co.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Gatke Corp.
General Electric Co., Apparatus Sales Div.
Jodee Plastics Co.
Lamtex Industries, Inc.
Maryland Lava Co.
Mica Fabricating Co.
Peerless Products Industries
Resistoflex Corp.
Rogers Corp.
Rubbercraft Corp. of California
Saxonburg Ceramics
Silicone Insulation, Inc.
D. M. Steward Mfg. Co.
Suprenant Mfg. Co.
Swedlow Plastics Co.
Synthane Corp.
TA Mfg. Corp.
Varflex Corp.
Zippertubing Co., The

Rods

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Crane Packing Co.
Crystal-X Corp.
Diamonite Products Mfg. Co.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
Franklin Fibre-Lamitex Corp.
Gatke Corp.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Magnetic Shield Div.-Pefection Mica Co.
Mica Fabricating Co.
Mycalex Corp. of America
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Resistoflex Corp.
Rogers Corp.
Rubbercraft Corp. of California
St. Regis Paper Co.
Silicone Insulation, Inc.
Solar Aircraft Co.
Spaulding Fibre Co., Inc.
D. M. Steward Mfg. Co.
Swedlow Plastics Co.
Synthane Corp.
Westlake Plastics, CrystalX Corp.

Sheets

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Crane Packing Co.
Crystal-X Corp.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Franklin Fibre-Lamitex Corp.
Gatke Corp.
General Gasket Inc.
Hastings Plastics Inc.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Mica Fabricating Co.
Mycalex Corp. of America
New England Laminates Co., Inc.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Resistoflex Corp.
Rogers Corp.
Rubbercraft Corp. of California
St. Regis Paper Co.
Seaman Products
Silicone Insulation, Inc.

Spaulding Fibre Co., Inc.
Swedlow Plastics Co.
Synthane Corp.
Warren Wire Co.
Westlake Plastics, CrystalX Corp.

Silicone Rubber Insulation Parts

Allied Plastics Supply Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Bacon Industries, Inc.
N. S. Baer Co.
William Brand & Co., Inc.
Chicago-Allis Mfg. Corp.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
Electronic Techniques, Inc.
Emerson Plastics Corp.
General Electric Co., Apparatus Sales Div.
General Gasket Inc.
B. F. Goodrich Aviation Products
New England Tape Co. Inc.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Rogers Corp.
Rubbercraft Corp. of California
Security Parachute Co.
Silicone Insulation, Inc.
Skytronics
Stevens Products, Inc.
Swedlow Plastics Co.
TA Mfg. Corp.
Varflex Corp.
Western Felt Works
Wrought Washer Mfg. Co.

Stampings & Punchings

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Auburn Mfg. Co., The
Bergen Carbide Co.
N. Braun Tool & Instrument Co., Inc.
Carroll Pressed Metal, Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
J. P. DeVine Mfg. Co.
Electronic Techniques, Inc.
Franklin Fibre-Lamitex Corp.
Gasket, Packing & Specialty Co., Inc.
General Components Inc.
General Gasket Inc.
Industrial Mica Corp.
Jodee Plastics Co.
Kickhaefer Mfg. Co.
Mica Fabricating Co.
Micacraft Products Inc.
J. J. Monaghan Co., Inc.
Mycalex Corp. of America
Pacific Cut Washer Co.
Parish Pressed Steel, Div.-Dana Corp.
Paul & Beekman, Inc.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Rogers Corp.
Rubbercraft Corp. of California
Ryan Aeronautical Co.
St. Regis Paper Co.
Sealectric Switch & Relay Corp.
Sinclair Mfg. Co.
Spaulding Fibre Co., Inc.
Spruce Pine Mica Co.
Swedlow Plastics Co.
Synthane Corp.
Transue & Williams Steel Forging Corp.
Universal Metal Products Inc.

INSULATORS

Accurate Electronics Corp., Dept D
Allied Plastics Suply Corp.
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Birnbach Radio Co., Inc.
Biwax Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Diamonite Products, Mfg. Co.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
Erie Resistor Corp.
Franklin Fibre-Lamitex Corp.
Garde Mfg. Co.
Gatke Corp.
General Ceramics Corp.
General Components Inc.
Hallett Mfg. Co.
Hastings Plastics Inc.
Isolantite Mfg. Corp.
Joclin Mfg. Co.
Jodee Plastics Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
Litton Industries, Components Div.
Maryland Lava Co.
Mica Fabricating Co.
Peerless Products Industries

Unusual forging solves Falcon design problem!

MISSILE BY HUGHES AIRCRAFT

Upset Forging by Commercial Shearing!

The JATO nozzle for the Hughes Falcon air-to-air guided missile presented some difficult metal forming problems.

Hogging it out of a cylindrical blank would involve considerable machining time and wasted material. Commercial engineers working with Hughes during the developmental stages of this missile produced an upset forging with a through-pierced hole of varying diameters involving tapers at both ends. The internal displacement method refines the grain and eliminates hidden flaws in the metal, assuring greater strength of the finished part.

Tough, unusual and tricky metal forming problems are routine at Commercial, where experience is combined with facilities for metal forming—by Upset Forging, Heavy Stamping or Rotoforming.

Commercial engineers have the experience and freedom to recommend the best method of meeting your problem—for short run or quantity production. They welcome the challenge of your missile production problem. Just send a sample blueprint or sketch of your problem part to The Commercial Shearing and Stamping Company, Dept. X-14, Youngstown 1, Ohio.

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COMMERCIAL shearing and stamping

Silicone Insulation, Inc.
D. M. Steward Mfg. Co.
Synthane Corp.
Tri-Dex Co.
*WESTINGHOUSE ELECTRIC CORP.
Wind Turbine Co.

JET ENGINES

American Welding & Mfg. Co., The
Continental Aviation & Engrg. Corp.
Eaton Mfg. Co., Inc., Fredric Flader Div.
General Electric Co., Apparatus Sales Div.
Royal Industries, Inc.
Turbo Dynamics Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

JOINT ASSEMBLIES

American Flexible Coupling Div., Zurn Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Chiksan Co.
*COOPER DEVELOPMENT CORP.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Telectro Industries Corp.
Vickery Co., The

JOINTS

Allegany Instrument Co., Inc.
American Flexible Coupling Div., Zurn Industries, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Century Fasteners Corp.
Chiksan Co.
Curtis Universal Joint Co., Inc.
Hammett Electric Co.
Walter K. Jaros, Aircrafters
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Sealol Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Vard, Inc.
Vickery Co., The

Ball

Allegany Instrument Co., Inc.
American Flexible Coupling Div., Zurn Industries, Inc.
Arrow Industries, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Century Fasteners Corp.
Corbin Products Div.
Engineered Products Co., The
Hammett Electric Co.
Walter K. Jaros, Aircrafters
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Parker Aircraft Co.
Republican Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Solar Aircraft Co.
Southwest Products Co.
Stainless Steel Products, Inc.
Vard, Inc.
Vickery Co., The

Swivel

American Flexible Coupling Div., Zurn Industries, Inc.
Arrow Industries, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Century Fasteners Corp.
Chiksan Co.
Hammett Electric Co.
Walter K. Jaros, Aircrafters
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Parker Aircraft Co.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Sealol Corp.
Southwest Products Co.
Stainless Steel Products, Inc.
Vard, Inc.
Vickery Co., The
Weatherhead Co., The

Torsion

American Flexible Coupling Div., Zurn Industries, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Hammett Electric Co.
Walter K. Jaros, Aircrafters
Republic Aviation Corp., Guided Missiles Div.
Stainless Steel Products, Inc.

Universal

Aero Supply Mfg. Co., Inc.
American Flexible Coupling Div., Zurn Industries, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Corbin Products Div.
Curtis Universal Joint Co., Inc.
Hammett Electric Co.
Walter K. Jaros, Aircrafters
Lovejoy Flexible Coupling Co.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Republic Aviation Corp., Guided Missiles Div.
Stainless Steel Products, Inc.

LEAD & ALLOYS

Accurate Specialties Co. Inc.
Alpha Metals, Inc.
Anchor Metal Co., Inc.
Bar Ray Products, Inc.
Belmont Smelting & Refining Works, Inc.
Bow Solder Products Co., Inc.
Division Lead Co.
Duroyd Gasket Mfg. Co.
Gasket, Packing & Specialty Co. Inc.
Goldsmith Brothers Smelting & Refining Co.
Solar Aircraft Co.

LINERS

ACF Industries, Inc., Advanced Products Div.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Welding & Mfg. Co., The
B. F. Goodrich Aviation Products
Hupp Aviation Co.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
Portland Copper & Tank Works Inc.
Reaction Motors, Inc.
Ryan Aeronautical Co.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Swedlow Plastics Co.
*WASHINGTON ALUMINUM CO., INC.
Wright Aeronautical Div., Curtiss-Wright Corp.

Can

ACF Industries, Inc., Advanced Products Div.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., The
Bridgwater Machine Co.
*COOPER DEVELOPMENT CORP.
Crystal-X Corp.
*DIVERSEY ENGRG. CO.
B. F. Goodrich Aviation Products
Hupp Aviation Co.
Kelsey-Hayes Co.
Paul & Beekman, Inc.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Vorac Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Wright Aeronautical Div., Curtiss-Wright Corp.

Combustion Chamber

ACF Industries, Inc., Advanced Products Div.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Welding & Mfg. Co., The
Bridgwater Machine Co.
California Aircraft Products
Carbone Corp., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Cuno Engrg. Corp., The
*DIVERSEY ENGRG. CO.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Flexonics Corp.
Hupp Aviation Co.
*IDEAL CHEMICAL PRODUCTS, INC.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
*LAVELLE AIRCRAFT CORP.
Norton Co.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Reaction Motors, Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
*C. W. TORNGREN CO., INC.
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Combustion Chamber, Gas Turbine Engine

ACF Industries, Inc., Advanced Products Div.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Welding & Mfg. Co., The
Bridgewater Machine Co.
Carbone Corp., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
*COOPER DEVELOPMENT CORP.
Cuno Engrg. Corp., The
*DIVERSEY ENGRG. CO.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hastings Plastics Inc.
Hupp Aviation Co.
Kelsey-Hayes Co.
*LAVELLE AIRCRAFT CORP.
*LYCOMING DIV., AVCO MFG. CORP.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

Metal

ACF Industries, Inc., Advanced Products Div.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., The
American Welding & Mfg. Co., The
Bridgewater Machine Co.
California Aircraft Products
*DIVERSEY ENGRG. CO.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Kelsey-Hayes Co.
Kemp Inc.
Kling Metal Spinning & Stamping Co.
Henry & Miller Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
*C. W. TORNGREN CO., INC.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Wright Aeronautical Div., Curtiss-Wright Corp.

Rocket Engine

ACF Industries, Inc., Advanced Products Div.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Welding & Mfg. Co., The
Carbone Corp., The
*COOPER DEVELOPMENT CORP.
*DIVERSEY ENGRG. CO.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Hastings Plastics Inc.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
*LAVELLE AIRCRAFT CORP.
Norton Co.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Reaction Motors, Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Thompson Products, Inc.
Turbo Dynamics Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

LIQUID FUELS

Air Products, Inc.
American Rocket Co.
Bios Labs., Inc.
Callery Chemical Co.
Esso Standard Oil Co.
Food Machine & Chemical Corp., Ordnance Div.
Fulton-Irgon Corp., The
Herrick L. Johnston, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Thompson Products, Inc.

LIQUID NITROGEN

Air Products, Inc.
Bios Labs., Inc.
Herrick L. Johnston, Inc.
Thompson Products, Inc.

LIQUID OXYGEN

Air Products, Inc.
Bios Labs., Inc.
Herrick L. Johnston, Inc.
Thompson Products, Inc.

LITHIUM

American Potash & Chemical Corp., National Northern Div.
American Rocket Co.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Foote Mineral Co.
Hammett Electric Co.
Lithium Corp. of America, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.

LOCKNUTS

Abbott Screw & Mfg. Co.
Affiliated Screw Products Co.
Corbin Products Div.
R. C. Dudek & Co.
Dumont Aircraft Fitting Co.
Elastic Stop Nut Corp. of America
Federal Screw Products Inc.
Hi-Shear Rivet Tool Co.
Walter K. Jaros, Aircrafters
Kemp Inc.
Kerns Mfg. Corp.
Lamson & Sessions Co., The
National Lock Co.
Nutt-Shel Co.
Rattan Mfg. Co., The
Republic Steel Corp.
SKF Industries, Inc.
Shur-Lok Corp.
Standard Pressed Steel Co.
Thompson-Bremer & Co.
United-Carr Fastener Corp.

LOCKS, HYDRAULIC

Bridgwater Machine Co.
Hydra-Power Corp.
Lyndon Aircraft, Inc.
Pacific Div.-Bendix Aviation Corp.

LOCKS, SHAFT

Amatom Electronic Hardware Co. Inc.
Bridgwater Machine Co.
Dalmore Corp.
General Components Inc.
Goe Engrg. Co.
Waldom Electronics Inc.

LUBRICANTS

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Alpha-Molykote Corp.
Bios Labs., Inc.
Drilube Co.
Electrofilm, Inc.
Esso Standard Oil Co.
E. F. Houghton & Co.
Kano Labs.
Lehigh Chemical Co.
Lockrey Co., The
Merix Chemical Co.
Monsanto Chemical Co.
New York & New Jersey Lubricant Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Protective Coatings, Inc.
Stewart-Warner Corp.
White & Bagley Co., The
Wye Industries

LUBRICATING DEVICES

Drilube Co.
***STALKER DEVELOPMENT CO.**
Stewart-Warner Corp.

MAGNESIUM & ALLOYS

Aluminum Co. of America
American Silver Co.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Dow Chemical Co., The
Light Metals, Inc.
Magline Inc.
South River Metal Products Co., Inc.

MAGNETOS AND PARTS

Arma Div.-American Bosch Arma Corp.
Hammett Electric Co.
Scintilla Div., Bendix Aviation Corp.

MANGANESE

Barium & Chemicals, Inc.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Foote Mineral Co.
Metals & Controls Corp.

MANIFOLDS

ACF Industries, Inc., Advanced Products Div.
Aeroquip Corp.
Associated Co., Inc.
Beaton & Corbin Mfg. Co., The
California Aircraft Products
Futurecraft Corp.
Herlo Engrg. Corp.
Houston Fearless Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Penn-Michigan Mfg. Corp.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
***UNITED AIRCRAFT PRODUCTS, INC.**
Weber Aircraft Corp.

Air System

ACF Industries, Inc., Advanced Products Div.
Aeroquip Corp.
***AMERICAN TUBE BENDING CO., INC.**
Associated Co., Inc.
Beaton & Corbin Mfg. Co., The
Flexonics Corp.
Futurecraft Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
Weber Aircraft Corp.
Westholt Mfg. Co.

Fuel

ACF Industries, Inc., Advanced Products Div.
Aeroquip Corp.
***AMERICAN TUBE BENDING CO., INC.**
Beaton & Corbin Mfg. Co., The
Cromer Mfg. & Engrg., Inc.
Flexonics Corp.
Futurecraft Corp.
Houston Fearless Corp.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
Resistoflex Corp.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Stainless Steel Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
Westholt Mfg. Co.

Ignition

ACF Industries, Inc., Advanced Products Div.
Beaton & Corbin Mfg. Co., The
Co-operative Industries, Inc.
General Laboratory Associates, Inc.
Hallett Mfg. Co.
Kelsey-Hayes Co.
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Skytronics
Solar Aircraft Co.

Intake and Exhaust

ACF Industries, Inc., Advanced Products Div.
Aircraft Mechanics, Inc.
Associated Co., Inc.
Beaton & Corbin Mfg. Co., The
California Aircraft Products
Cromer Mfg. & Engrg., Inc.
Flexonics Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thompson Products, Inc.

Nitrogen

ACF Industries, Inc., Advanced Products Div.
Aeroquip Corp.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
***AMERICAN TUBE BENDING CO., INC.**
ARO Equipment Corp., The
Cromer Mfg. & Engrg., Inc.
Herrick L Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Oxygen Equipment & Service Co.
Solar Aircraft Co.
Stainless Steel Products, Inc.

Oxygen

ACF Industries, Inc., Advanced Products Div.
Aeroquip Corp.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
***AMERICAN TUBE BENDING CO., INC.**
ARO Equipment Corp., The
Carleton Aviation Co., Inc.
Cromer Mfg. & Engrg., Inc.
Houston Fearless Corp.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Oxygen Equipment & Service Co.
Puritan Compressed Gas Corp., Aviation Div.
Rohr Aircraft Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.

Primer

ACF Industries, Inc., Advanced Products Div.
***AMERICAN TUBE BENDING CO., INC.**
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Stainless Steel Products, Inc.

MANIPULATORS, NUCLEAR

Central Research Laboratories, Inc.
Mechanical Div.-General Mills, Inc.

MASKS, APERTURE, TUBE

Skiatron Electronics & Television Corp.
Waldom Electronics Inc.

MERCURY

Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Dynametrics Corp.
Eastern Smelting & Refining Corp.
Hammett Electric Co.

METAL CLAD SHEETS

Allied Plastics Supply Corp.
Aluminum Co. of America
American Silver Co.
Belmont Smelting & Refining Works, Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dwyer Engrg. Co., Inc.
Lukens Steel Co.
Luria Engrg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Metals & Controls Corp.
New England Laminates Co., Inc.
Revere Copper & Brass Inc.
Synthane Corp.
Techniques, Inc.
United Mfg. Co., The
United States Steel Corp.

METAL MACHINING

Abalon Precision Mfg. Corp.
Advanced Electronics, Inc.
Aerodex, Inc.
Aircraft Mechanics, Inc.
American Optical Co., Instrument Div.
Ampco Metal, Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Co., Inc.
Bergen Carbide Co.
Bridgwater Machine Co.
Bullard Co., The
J. H. Bunnell & Co.
California Aircraft Products
Champion Airquipment Inc.
C. B. Christiansen Co.
Clark-Aiken Co., The
Clausing Div.-Atlas Press Co.
***COOPER DEVELOPMENT CORP.**
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
G. M. Diehl Machine Works
***DIVERSEY ENGRG. CO.**
Dwyer Engrg. Co., Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Federal Machine Co., Inc.
Foote Brothers Gear & Machine Corp.
Freeman Co., The
G. W. Galloway Co.
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
Goodyear Aircraft Corp.
Graflex, Inc.
B. H. Hadley, Inc.
Hahn & Clay
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Heldor Mfg. Co., Inc.
Henry & Miller Industries, Inc.
Alfred Hofmann & Co.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Huber Industries, Inc.
Hupp Aviation Co.
Ingersoll Kalamazoo Div., Borg-Warner Corp.

. . . propulsion system

Walter K. Jaros, Aircrafters
Jennings & Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kemp Inc.
Kerns Mfg. Corp.
Keystone Electronics Corp.
Ladish Co.
La Pointe Industries Inc.
Livingston Electronic Corp.
Luria Engrg. Co.
Lytle Engrg. & Mfg. Co.
R. C. Mahon Co., The
J. A. Maurer, Inc.
Mechanical Div.-General Mills, Inc.
Mercury Air Parts Co., Inc.
Mercury International Industries, Inc.
Metal Masters, Inc.
Micro-Wire Tungsten & Molybdenum Products
Milman Engrg. Co.
O & M Machine Co., Inc.
Onsrud Machine Works, Inc.
Ozone Metal Products Corp.
Parish Pressed Steel, Div.-Dana Corp.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Philco Corp., Government & Industrial Divs.
Phillips Aviation Co.
Rowe Industries
Ryan Aeronautical Co.
*SCREW PRODUCTS CORP. OF AMERICA
Sesco Mfg., Inc.
Smith-Morris Corp.
South River Metal Products Co., Inc.
Specialties Mfg. Co., Inc.
Springfield Brass Co.
Standard Armament Inc.
Wm. Steinen Mfg. Co.
Technical Oil Tool Corp.
Thompson Products, Inc.
Arthur Tickle Engrg. Works, Inc.
Twix Mfg. Co., Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
United Mfg. Co., The
Universal Metal Products Inc.
Uniwave, Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Warren Mfg. Div., Warren Brothers Roads Co.
Wells Industries Corp.
Western Arc Welding, Inc.
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Wind Turbine Co.
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss-Wright Corp.

METAL PARTS

Abalon Precision Mfg. Corp.
Aerolite Electronics Corp.
Kerns Mfg. Corp.
American Brass Co., The
American Standard Products, Inc.
Amplex Div.-Chrysler Corp.
Belmont Smelting & Refining Works, Inc.
Bergen Carbide Co.
Bound Brook Oil-Less Bearing Co.
Bridgwater Machine Co.
J. H. Bunnell & Co.
Century Fasteners Corp.
Chicago Screw Co., The, Div.-Standard Screw Co.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
*COOPER DEVELOPMENT CORP.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Dumont Aircraft Fitting Co.
Ex-Cell-O Corp.
Falstrom Co.
Federal Machine Co. Inc.
Garde Mfg. Co.
Geartronics Corp.
B. H. Hadley, Inc.
Hamilton Watch Co., Military Products Div.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kemp Inc.
Keystone Electronics Corp.
La Pointe Industries Inc.
*LAVEZZI MACHINE WORKS
Litton Industries, Components Div.
Lytle Engrg. & Mfg. Co.
J. A. Maurer, Inc.
Menasco Mfg. Co.
Mercury Air Parts Co., Inc.
Merz Engrg., Inc.
Metal Masters, Inc.
R. I. Metpro, Inc.
Misco Precision Casting Co.
Ozone Metal Products Corp.
Peerless Products Industries
Raybestos-Manhattan, Inc.
Republic Aviation Corp., Guided Missiles Div.
Rosan, Inc.
Ryan Aeronautical Co.
St. Marys Carbon Co.
*SCREW PRODUCTS CORP. OF AMERICA
Seamless Products Co., Inc.
Smith-Morris Corp.
Springfield Brass Co.
Wm. Steinen Mfg. Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Sylvania Electric Products Inc., Parts Div.
Titan Metal Mfg. Co.
Torrington Co., The
Transue & Williams Steel Forging Corp.
United Shoe Machinery Corp.
Uniwave, Inc.
*WASHINGTON ALUMINUM CO., INC.
Winder Aircraft Corp. of Fla.

Bushings

Acme Industrial Co.
Affiliated Screw Products Co.
Aircraft Fitting Co., The
American Brake Shoe Co.
American Non Gran Bronze Co.
American Standard Products, Inc.
American Steel Foundries, Hammond Div.
Amplex Div.-Chrysler Corp.
Associated Co., Inc.
Bergen Carbide Co.
Bound Brook Oil-Less Bearing Co.
J. H. Bunnell & Co.
Century Fasteners Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Corbin Products Div.
Dayton Mfg. Co., Inc.
R. C. Dudek & Co.
Dumont Aviation Fitting Co.
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Engineered Products Co., The
Ex-Cell-O Corp.
Federal Machine Co. Inc.
General Cable Corp.
General Components Inc.
General Railway Signal Co.
B. H. Hadley, Inc.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kemp Inc.
La Pointe Industries Inc.
Litton Industries, Components Div.
*LYCOMING DIV., AVCO MFG. CORP.
J. A. Maurer, Inc.
Mercury Air Parts Co., Inc.
Henry & Miller Industries, Inc.
Orange Roller Bearing Co., Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Parker Aircraft Co.
Peerless Products Industries
Progressive Research & Development Co., Inc.
True Alloys Inc.
Randall Graphite Bearings, Inc.
Rattan Mfg. Co., The
Rosan, Inc.
St. Marys Carbon Co.
*SCREW PRODUCTS CORP. OF AMERICA
Seamless Products Co., Inc.
Southwest Products Co.
Springfield Brass Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.

Lead

Alpha Metals, Inc.
Anchor Metal Co. Inc.
Bar-Ray Products, Inc.
Belmont Smelting & Refining Works, Inc.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Division Lead Co.

Powdered

Amplex Div.-Chrysler Corp.
Bound Brook Oil-Less Bearing Co.
Cuno Engrg. Corp., The
Division Lead Co.
Eaton Mfg. Co.
Gibson Electric Co.
Magnetic Shield Div.-Perfection Mica Co.
J. A. Maurer, Inc.
Raybestos-Manhattan, Inc.
St. Marys Carbon Co.
*STAINLESS PROCESSING DIV., WALL COLMONOY CORP.
Stewart-Warner Corp.
Superior Carbon Products, Inc.
Uniwave, Inc.
S. K. Wellman Co., The
*WESTINGHOUSE ELECTRIC CORP.

Screw Machine

Abalon Precision Mfg. Corp.
Abbott Screw & Mfg. Co.
Acme Industrial Co.
Affiliated Screw Products Co.
Airborne Research & Development Corp.
Aircraft Fitting Co., The
All American Aircraft Products, Inc.
Aluminum Co. of America
Amatom Electronic Hardware Co. Inc.
American Non Gran Bronze Co.
American Standard Products, Inc.
American Tool Co.
Associated Co., Inc.
Auburn Spark Plug Co., Inc.
Bergen Carbide Co.
Bland Burner Co., The
Brighton Tool & Die Co.
J. H. Bunnell & Co.
Century Fasteners Corp.
Champion Airquipment Inc.
Chicago Screw Co., The, Div.-Standard Screw Co.
Circon Component Corp.
Connector Corp. of America
Corbin Products Div.
Dalmore Corp.
Dayton Mfg. Co., Inc.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Electronic Techniques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Engineered Products Co., The
Freeman Co., The
Geartronics Corp.
General Components Inc.
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
Goe Engrg. Co.
Graflex, Inc.
Hamilton Watch Co., Military Products Div.
*HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.
Alfred Hofmann & Co.
Walter K. Jaros, Aircrafters
Jones & Lamson Machine Co.
Kasar Mfg. & Distributing Co., Inc.
Litton Industries, Components Div.
*LYCOMING DIV., AVCO MFG. CORP.
J. A. Maurer, Inc.
Mercury Air Parts Co., Inc.
Henry & Miller Industries, Inc.
National Airoil Burner Co.
National Lock Co.
Orange Roller Bearing Co., Inc.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Philco Corp., Government & Industrial Divs.
H. K. Porter Inc.
Precise Instrument Parts Co., A Corp.
Research Development Mfg. Inc.
Rosan, Inc.
*SCREW PRODUCTS CORP. OF AMERICA
Seamless Products Co., Inc.
Sinclair Mfg. Co.
Skinner Precision Products
Specialties Mfg. Co., Inc.
Springfield Brass Co.
Herman D. Steel Co.
Wm. Steinen Mfg. Co.
A. U. Stone & Co., Inc.
Standard Locknut & Lockwasher Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Technical Oil Tool Corp.
Titan Metal Mfg. Co.
Torrington Co., The
Vemaline Products Co.
Waltham Screw Co.
Wenco Mfg. Co.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Winder Aircraft Corp. of Fla.
J. H. Winn Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

Small Metal Stampings

A&P Metal Products Mfg. Corp.
Abalon Precision Mfg. Corp.
Abbott Screw & Mfg. Co.
Accurate Electronics Corp., Dept. D
Accurate Specialties Co. Inc.
Acme Mfg. & Gasket Co.
Aerodex, Inc.
Aerolite Electronics Corp.
Aircraft Mechanics, Inc.
All American Aircraft Products, Inc.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Anchor Metal Co. Inc.
Art Wire & Stamping Co.
Associated Co., Inc.
Atlas E-E Corp.
Auburn Mfg. Co., The
Basic Tool Industries, Inc.
Bergen Carbide Co.
H. Braun Tool & Instrument Co., Inc.
Buffalo Metal Container Corp.
J. H. Bunnell & Co.
Butler Mfg. Co.
California Aircraft Products
Carroll Presed Metal, Inc
Corbin Products Div.
Dayton Mfg. Co., Inc.
J. P. DeVine Mfg. Co.
Dumont Aviation Associates
Electronic Techinques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Elm Mfg. Co. Inc.
Engineered Products Co., The
Erie Resistor Corp.

Essex Mfg. Co., Inc.
Garde Mfg. Co.
Gasket Mfg. Co., Inc.
Gasket, Packing & Specialty Co., Inc.
General Components Inc.
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
Graflex, Inc.
Hamilton Watch Co., Military Products Div.
Hunter Spring Co.
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kickhaefer Mfg. Co.
Kling Metal Spinning & Stamping Co.
La Pointe Industries Inc.
Leetronics, Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Lytle Engrg. Mfg. Co.
Malco Tool & Mfg. Co.
Mercury Air Parts Co., Inc.
Metal Forming Corp.
Metal Masters, Inc.
R. I. Metpro, Inc.
Micro-Wire Tungsten & Molybdenum Products
Henry & Miller Industries, Inc.
National Lock Co.
Ozone Metal Products Corp.
Pacific Cut Washer Co.
Parish Pressed Steel, Div.-Dana Corp.
Paul & Beekman, Inc.
Peerless Products Industries
Permax Products Div., Chisholm-Ryder Co., Inc.
Philco Corp., Government & Industrial Divs.
Positive Lock Washer Co., The
Progressive Research & Development Co., Inc.
Reliable Spring & Wire Forms Co., The
Roland Teiner Co. Inc.
Rowe Industries
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
St. Marys Carbon Co.
Schaffer Air Industries, Inc.
Sealectric Switch & Relay Corp.
Seamless Products Co., Inc.
Sinclair Mfg. Co.
Smith-Morris Corp.
South River Metal Products Co., Inc.
Specialties Mfg. Co., Inc.
***STAINLESS PROCESSING DIV., WALL COLMONOY CORP.**
Standard Armament Inc.
Wm. Steinen Mfg. Co.
Superior Spinning & Stamping Co.
Sylvania Electric Products Inc., Parts Div.
Technical Oil Tool Corp.
Techniques, Inc.
Thompson Products, Inc.
Transue & Williams Steel Forging Corp.
Tricon Mfg. Co.
Turbo Products, Inc.
Twix Mfg. Co., Inc.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Shoe Machinery Corp.
Waterbury Companies, Inc.
Wenco Mfg. Co.
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Winder Aircraft Corp. of Fla.
J. H. Winn Inc.
Wrought Washer Mfg. Co.

Spinnings

Amatom Electronic Hardware Co. Inc.
Associated Co., Inc.
California Aircraft Products
Dayton Mfg. Co., Inc.
Dean & Benson Research Inc.
***DIVERSEY ENGRG. CO.**
Elgin Micronics-West Coast Div.-Elgin National Watch Co.
Food Machine & Chemical Corp., Ordnance Div.
Henry & Miller Industries, Inc.
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kling Metal Spinning & Stamping Co.
La Pointe Industries Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
***PHOENIX PRODUCTS CO.**
Royal Industries, Inc.
Seamless Products Co., Inc.
Spincraft, Inc.
Superior Spinning & Stamping Co.
Roland Teiner Co. Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
***UNITED AIRCRAFT PRODUCTS, INC.**
United States Chemical Milling Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Trimmings

Elgin Micronics, West Coast Div.-Elgin National Watch Co.
General Railway Signal Co.
Henry & Miller Industries, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
La Pointe Industries Inc.
Smith-Morris Corp.

Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Winder Aircraft Corp. of Fla.

MIDFRAME SECTIONS

Ainslie Corp.
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Arnolt Corp.
Associated Co., Inc.
Morris Bean & Co.
Bridgwater Machine Co.
***DIVERSEY ENGRG. CO.**
Goodyear Aircraft Corp.
Alfred Hofmann & Co.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
Parish Pressed Steel, Div.-Dana Corp.
Portland Copper & Tank Works Inc.
Republic Aviation Corp., Guided Missiles Div.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Royal Industries, Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Twix Mfg. Co., Inc.
United Mfg. Co., The
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss-Wright Corp.

MISSILE BOOSTERS

American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE FOUNDRY CO.**
American Rocket Co.
American Welding & Mfg. Co., The
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
G. W. Galloway Co.
Goodyear Aircraft Corp.
***GRAND CENTRAL ROCKET CO.**
***GREER HYDRAULICS, INC.**
Hahn & Clay
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Lukens Steel Co.
McCormick Selph Associates
Pressed Steel Tank Co.
Propellex Chemical Corp.
Reaction Motors, Inc.
Republic Aviation Corp., Guided Missiles Div.
Standard Armament, Inc.
Thompson Products, Inc.
Wheland Co., The
Winder Aircraft Corp. of Fla.
Wright Aeronautical Div., Curtiss-Wright Corp.

MONOPROPELLANTS

Air Products, Inc.
American Rocket Co.
Atlantic Research Corp.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Thompson Products, Inc.

MOTORS, CLOCK

Advanced Products Co., The
American Brass Co., The
Globe Industries, Inc.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Hansen Mfg. Co., Inc.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Hunter Spring Co.
Instrument Motors

MOTORS, CONTROL

A&P Metal Products Mfg. Corp.
Airborne Accessories Corp.
Air-Marine Motors, Inc.
American Electronics, Inc.
Ashland Electric Products, Inc.
Bodine Electric Co.
Celco-Constantine Engrg. Laboratories Co.
Cutler-Hammer Inc.
Joe Davidson & Associates
Diehl Mfg. Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electric Indicator Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Helipot Corp.
Hertner Electric Co., The
Hoover Electric Co.
Industrial Control Co.

Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co., Inc.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Librascope Inc.
Motordyne Inc.
National Pneumatic Co., Inc.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Rae Motor Corp.
Servomechanisms, Inc.
Servomechanisms, Inc., Mechatrol Div.
Small Motors Inc.
Solar Aircraft Co.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Talley Corp., The
Universal Electric Co.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

MOUNTINGS, METALLIC

***AMERICAN MACHINE & FOUNDRY CO.**
American Steel Foundries, Hammond Div.
Bridgwater Machine Co.
General Cable Corp.
Graflex, Inc.
Huber Industries, Inc.
La Pointe Industries, Inc.
J. A. Maurer, Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Parish Pressed Steel, Div.-Dana Corp.
Republic Aviation Corp., Guided Missiles Div.
Robinson Aviation, Inc.
Ryan Aeronautical Co.
Thompson Products, Inc.
United Mfg. Co., The
***WASHINGTON ALUMINUM CO., INC.**
Winder Aircraft Corp. of Fla.

MOUNTINGS, NON METALLIC

Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
Gatke Corp.
Republic Aviation Corp., Guided Missiles Div.
Rubbercraft Corp. of California
Winder Aircraft Corp. of Fla.

MOUNTINGS, VIBRATION AND SHOCK

***AMERICAN MACHINE & FOUNDRY CO.**
American Steel Foundries, Hammond Div.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Calfibe Co., Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Columbia Research Labs.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
Joe Davidson & Associates
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Gatke Corp.
General Cable Corp.
Hamilton Kent Mfg. Co.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Walter K. Jaros, Aircrafters
Walter Kidde & Co., Inc., Aviation Div.
La Pointe Industries Inc.
MB Mfg. Co.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Robinson Aviation, Inc.
Rubbercraft Corp. of California
Thompson Products, Inc.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United Mfg. Co., The
United-Carr Fastener Corp.
***WASHINGTON ALUMINUM CO., INC.**
Winder Aircraft Corp. of Fla.

MOUNTS, ANTENNA

Ainslie Corp.
Airborne Instruments Lab., Inc.
All American Aircraft Products, Inc.
American Brass Co., The
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Antlab Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dayton Aircraft Products, Inc.
G. M. Dykes Iron Works, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Elm Mfg. Co., Inc.
General Railway Signal Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
La Pointe Industries, Inc.
MB Mfg. Co.
Mechanical Div.-General Mills, Inc.
Permax Products Div., Chisholm-Ryder Co., Inc.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Robinson Aviation, Inc.

. . . propulsion system

Robot Appliances Inc.
Shaw Metal Products Corp.
Solar Aircraft Co.
Technical Appliance Corp.
Telectro Industries Corp.
Twix Mfg. Co., Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wind Turbine Co.
Winder Aircraft Corp. of Fla.

MOUNTS, ENGINE

ACF Industries, Inc., Advanced Products Div.
***AMERICAN MACHINE & FOUNDRY CO.**
Applied Design Co.
Arnolt Corp.
Bridgwater Machine Co.
Calcor Corp., Aircraft Div.
Columbia Research Labs.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Fläder Div.
Herlo Engrg. Corp.
Alfred Hofmann & Co.
Houston Fearless Corp.
Walter K. Jaros, Aircrafters
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
La Pointe Industries, Inc.
***LAVELLE AIRCRAFT CORP.**
***LYCOMING DIV., AVCO MFG. CORP.**
MB Mfg. Co.
Republic Aviation Corp., Guided Missiles Div.
Robinson Aviation, Inc.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
Skinner Precision Products
Smith-Morris Corp.
Southwest Products Co.
Thompson Products, Inc.
United Mfg. Co., The
***WASHINGTON ALUMINUM CO., INC.**
Western Arc Welding, Inc.
Winder Aircraft Corp. of Fla.

MOUNTS, SHOCK

***AMERICAN MACHINE & FOUNDRY CO.**
American Steel Foundries, Hammond Div.
Applied Design Co.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Barry Controls, Inc.
Bridgwater Machine Co.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Joe Davidson & Associates
Finn Aeronautical Div., T. R. Finn & Co., Inc.
General Cable Corp.
Hamilton Kent Mfg. Co.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Walter K. Jaros, Aircrafters
K. W. Johnson & Co., Inc.
MB Mfg. Co.
Narda Microwave Corp., The
Pacific Moulded Products Co.
Robinson Aviation, Inc.
Rubercraft Corp. of California
Telectro Industries Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United Mfg. Co., The
Winder Aircraft Corp. of Fla.

MOUNTS, THERMISTOR

Advanced Electronics Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Telectro Industries Corp.
Vap-Air Div., Vapor Heating Corp.
Winder Aircraft Corp. of Fla.

MUFFLERS, JET ENGINE INTAKE AND EXHAUST

ACF Industries, Inc., Advanced Products Div.
Allied Witan Co. Inc.
Associated Co., Inc.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
***LYCOMING DIV., AVCO MFG. CORP.**
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.

MUFFS

Allied Witan Co. Inc.
Associated Co., Inc.
Ryan Aeronautical Co.

MULTIMETERS

American Metrix Corp.
***COOPER DEVELOPMENT CORP.**
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Phaostron Instrument & Electronic Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Transvision, Inc.
Varo Mfg. Co.
Wacline, Inc.

MULTIVIBRATORS

Abrams Instrument Corp.
Alto Scientific Co., Inc.
Bendix Aviation Corp., York Div.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Hammett Electric Co.
Resdel Engrg. Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

NITROGEN, LIQUID

Air Products, Inc.
Bios Labs., Inc.
Herrick L. Johnston, Inc.
Solar Aircraft Co.
Thompson Products, Inc.

NOZZLE ASSEMBLIES

American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Bridgwater Machine Co.
***BUCKEYE IRON & BRASS WORKS**
California Aircraft Products
Christie Machine Works
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Engineered Products Co., The
Ex-Cell-O Corp.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
G. W. Galloway Co.
Hahn & Clay
Heldor Mfg. Co., Inc.
Herlo Engrg. Corp.
Houston Fearless Corp.
Hupp Aviation Co.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Lamtex Industries, Inc.
National Airoil Burner Co.
Parker Aircraft Co.
Portland Copper & Tank Works Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ryan Aeronautical Co.
Smith-Morris Corp.
Spraying Systems Co.
***STALKER DEVELOPMENT CO.**
Wm. Steinen Mfg. Co.
A. U. Stone & Co., Inc.
Thompson Products, Inc.
Turbo Products, Inc.
Vickery Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

NOZZLE DIAPHRAGMS

Continental Diamond Fibre Corp., Sub.-The Budd Co.
***DIVERSEY ENGRG. CO.**
Fluorocarbon Co. Inc., The
Herlo Engrg. Corp.
Houston Fearless Corp.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kerns Mfg. Corp.
Portland Copper & Tank Works Inc.
Reeves Brothers Inc., Vulcan Rubber Products Div.
Ryan Aeronautical Co.
Spraying Systems Co.
***STALKER DEVELOPMENT CO.**
Thompson Products, Inc.
Turbo Products, Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

NOZZLES

Allegany Instrument Co., Inc.
American Aerophysics Corp.
American Brass Co., American Metal Hose Div.
American Welding & Mfg. Co., The
Beaton & Corbin Mfg. Co., The
Bridgwater Machine Co.
***CAMERON IRON WORKS, INC.**
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Engineered Products Co., The
Ex-Cell-O Corp.
Federal Machine Co. Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Goodyear Aircraft Corp.
Hahn & Clay
Hamilton Watch Co., Military Products Div.
Herlo Engrg. Corp.
Hicks Corp., The
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Ladish Co.
Lamtex Industries, Inc.
Menasco Mfg. Co.
Portland Copper & Tank Works Inc.
Republic Aviation Corp., Guided Missiles Div.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ryan Aeronautical Co.
Solar Aircraft Co.
Spraying Systems Co.
***STALKER DEVELOPMENT CO.**
H. I. Thompson Fibre Glass Co.
Turbo Dynamics Corp.
United Carbon Products Co.
Whittaker Controls, Div.-Telecomputing Corp.

Exhaust

Allegany Instrument Co., Inc.
American Brass Co., American Metal Hose Div.
American Car & Foundry Div., ACF Industries, Inc.
American Rocket Co.
American Welding & Mfg. Co., The
Associated Co., Inc.
Bridgwater Machine Co.
California Aircraft Products
***CAMERON IRON WORKS, INC.**
***COMMERCIAL SHEARING & STAMPING CO.**
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Engineered Products Co., The
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hahn & Clay
Herlo Engrg. Corp.
Hicks Corp., The
Hupp Aviation Co.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Ladish Co.
Lamtex Industries, Inc.
Marquardt Aircraft Co.
Menasco Mfg. Co.
Parish Pressed Steel, Div.-Dana Corp.
Portland Copper & Tank Works Inc.
Reaction Motors, Inc.
Republic Aviation Corp., Guided Missiles Div.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Spraying Systems Co.
***C. W. TORNGREN CO., INC.**
Turbo Dynamics Corp.
Turbo Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Exhaust, Metallic

Allegany Instrument Co., Inc.
American Brass Co., American Metal Hose Div.
American Car & Foundry Div., ACF Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Bridgwater Machine Co.
California Aircraft Products
***CAMERON IRON WORKS, INC.**
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hahn & Clay
Henry & Miller Industries, Inc.
Hicks Corp., The
Hupp Aviation Co.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kemp Inc.
Ladish Co.
***LAVELLE AIRCRAFT CORP.**
Marquardt Aircraft Co.
Menasco Mfg. Co.
Parish Pressed Steel, Div.-Dana Corp.
***PHOENIX PRODUCTS CO.**
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Reaction Motors, Inc.
Republic Aviation Corp., Guided Missiles Div.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Size Control Co.
Smith-Morris Corp.
Spraying Systems Co.
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
Turbo Dynamics Corp.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.

Exhaust, Non Metallic

Carbone Corp., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
*COOPER DEVELOPMENT CORP.
Emerson Plastics Corp.
Graphite Metallizing Corp.
Hastings Plastics Inc.
Hupp Aviation Co.
Lamtex Industries, Inc.
Chester Morton Electronics Corp.
Ohio Carbon Co., The
Parker Aircraft Co.
Reaction Motors, Inc.
Republic Aviation Corp., Guided Missile Div.
Silicone Insulation, Inc.
Spraying Systems Co.
H. I. Thompson Fiber Glass Co.
Turbo Dynamics Corp.
United Carbon Products Co.
Zirconium Corp. of America

Fuel Injection

Beaton & Corbin Mfg. Co., The
Bendix Products Div., Bendix Aviation Corp.
California Aircraft Products
Carbone Corp., The
Diamonite Products Mfg. Co.
Eddington Metal Specialty Co.
Engineered Products Co., The
Ex-Cell-O Corp.
Houston Fearless Corp.
Walter J. Hyatt Co., The
Marquardt Aircraft Co.
National Airoil Burner Co.
Reaction Motors, Inc.
Solar Aircraft Co.
Spraying Systems Co.
Wm. Steinen Mfg. Co.
*UNITED AIRCRAFT PRODUCTS, INC.
Vickery Co., The
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

NUCLEAR CONTROLS, REACTOR

American Electronics, Inc.
*ANTON ELECTRONIC LABS., INC.
Bendix Products Div., Bendix Aviation Corp.
CDC Control Services, Inc.
Consolidated Controls Corp.
Daystrom Instrument Div., Daystrom, Inc.
*DIVERSEY ENGRG. CO.
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
Kemp Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Solar Aircraft Co.
Sunstrand Turbo Div., Sundstrand Machine Tool Co.
Telectro Industries Corp.
Teleflex Inc.
Thompson Products, Inc.
United Shoe Machinery Corp.
Vard Inc.
*WESTINGHOUSE ELECTRIC CORP.

NUCLEAR SHIELDING, RADIATION

ACF Industries, Inc., Advanced Products Div.
Aluminum Co. of America
American Electronics, Inc.
American Silver Co.
Bar-Ray Products, Inc.
Corning Glass Works
Crystal-X Corp.
Division Lead Co.
G. W. Galloway Co.
Garrett Corp., The, Air Cruisers Div.
Gasket, Packing & Specialty Co. Inc.
Lukens Steel Co.
Metallurgical Products Dept., General Electric Co.
Norton Co.
Nuclear Corp. of America, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Radiation Counter Labs., Inc.
Solar Aircraft Co.
Telectro Industries Corp.
Wells Industries Corp.

OXIDIZERS

Air Products, Inc.
Allied Chemical & Dye Corp., Nitrogen Div.
American Potash & Chemical Corp., National Northern Div.
American Rocket Co.
Barium & Chemicals, Inc.
Delta Chemical Works, Inc.
Escambia Chemical Corp.
Foote Mineral Co.
General Chemical Div., Allied Chemical & Dye Corp.
Herrick L. Johnston, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Rohr Aircraft Corp
Shell Chemical Corp.

PAINTS, METALLIC

Amercoat Corp.
Avondale Co., The
*DATA-CONTROL SYSTEMS INC.
Delta Chemical Works, Inc.
Dennis Chemical Co.
Fidelity Chemical Products Corp.
Goldsmith Brothers Smelting & Refining Co.
Vorac Co., The
Zophar Mills Inc.

PALLADIUM

American Silver Co.
Anchor Metal Co. Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eastern Smelting & Refining Corp.
Electro Tec Corp., Virginia Div.
Engelhard Industries Inc., D. E. Makepeace Div.
Handy & Harman
Metals & Controls Corp.
Roll Formed Products Co.
Tricon Mfg. Co.
Western Gold & Platinum

PINS, TUBULAR

Affiliated Screw Products Co.
American Printed Circuits Co., Inc.
Century Fasteners Corp.
Connector Corp.
Corbin Products Div.
Dumont Aviation Associates
Elastic Stop Nut Corp. of America
Keystone Electronics Corp.
Metal Forming Corp.
Standard Pressed Steel Co.

PLASTIC-FIBER GLASS

Allied Plastics Supply Corp.
American Aerophysics Corp.
American Printed Circuits Co., Inc.
Aristocrat Plastics, Inc.
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Basic Tool Industries, Inc.
Calfibe Co., Inc.
Coast Mfg. & Supply Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Cordo Molding Products, Inc.
Duracote Corp.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Garrett Corp., The, Air Cruisers Div.
Goodyear Aircraft Corp.
Hammett Electric Co.
Hampden Brass & Aluminum Co.
Hastings Plastics Inc.
Hays Mfg. Co.
Joclin Mfg. Co.
Walter Kidde & Co., Inc., Aviation Div.
Lamtex Industries, Inc.
*LONE STAR PLASTICS CO. INC.
McMillan Industrial Corp.
Mercury International Industries Inc.
Narmco Resins & Coatings Co.
New England Laminates Co., Inc.
Olympic Plastics Co., Inc.
Plastic Age Sales, Inc.
Regal Plastic Co.
Resdel Corp.
St. Regis Paper Co.
Silicone Insulation, Inc.
Spartan Marking Corp.
Swedlow Plastics Co.
Synthane Corp.
H. I. Thompson Fiber Glass Co.
Topper Mfg. Co., Inc.
Truxton Industries, Inc.
Turbo Dynamics Corp.
Waterbury Companies, Inc.

PLASTIC—FLUOROCARBONS

Allied Plastics Supply Corp.
American Printed Circuits Co., Inc.
Aristocrat Plastics, Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crane Packing Co.
Crystal-X Corp.
Dixon Corp.
Emerson Plastics Corp.
Fluorocarbon Co. Inc., The
Furane Plastics, Inc.
Garde Mfg. Co.
General Gasket Inc.
General Plastics Corp. of New Jersey
Halogen Insulator & Seal Corp.
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Jodee Plastics Co.
Plastic Age Sales, Inc.

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Surprenant Mfg. Co.
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PLASTIC—SILICONES

Allied Plastics Supply Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Cordo Molding Products, Inc.
Emerson Plastics Corp.
Garrett Corp., The, Air Cruisers Div.
General Gasket Inc.
Hammett Electric Co.
Joclin Mfg. Co.
***LONE STAR PLASTICS CO. INC.**
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New England Tape Co. Inc.
Olympic Plastics Co., Inc.
Plastic Age Sales, Inc.
St. Regis Paper Co.
Silicone Insulation Inc.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Spartan Marking Corp.
Surprenant Mfg. Co.
Swedlow Plastics Co.
Synthane Corp.

PLATES, INSTRUCTION

Acromark Co., The
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
Atlantic Engravers, Inc.
Canadian Radium & Uranium Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crystal-X Corp.
Electric Auto-Lite Co., The
Etched Products Corp.
Hays Mfg. Co.
Industrial Engravers Inc.
Jodee Plastics Co.
Roovers-Lotson Corp.
Sohl Co., The
United States Radium Corp.
Waldom Electronics Inc.

PLATES, METAL OR PLASTIC

Acromark Co., The
Aerolite Electronics Corp.
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
Aristocrat Plastics, Inc.
Atlantic Engravers, Inc.
J. Bishop & Co. Platinum Works
Canadian Radium & Uranium Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crucible Steel Co. of America
Dale Products, Inc.
Electric Auto-Lite Co., The
Electronic Techniques, Inc.
Emerson Plastics Corp.
Erie Resistor Corp.
Etched Products Corp.
General Railway Signal Co.
Hastings Plastics Inc.
Haynes Stellite Co., Div.-Union Carbide Corp.
Industrial Engravers Inc.
Joclin Mfg. Co.
Jodee Plastics Co.
Lukens Steel Co.
R. C. Mahon Co., The
Henry & Miller Industries, Inc.
New England Laminates Co., Inc
Olympic Plastics Co., Inc.
Plastic Age Sales, Inc.
Revere Copper & Brass Inc.
Roovers-Lotson Corp.
Sightmaster Corp.-Mutual Electronic Industries Inc.
Sohl Co., The
Synthane Corp.
Thompson Products, Inc.
United Mfg. Co., The
United States Radium Corp.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America
Waldom Electronics Inc.
Waterbury Companies, Inc.
Westlake Plastics, CrystalX Corp.
Wrought Washer Mfg. Co.

PLATING, PRECIOUS METAL

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Bart Mfg. Corp.
Cohan Epner Co. Inc.
Drilube Co.
Eljay Corp.
Goldsmith Brothers Smelting & Refining Co.
Hammett Electric Co.
Harper-Leader, Inc.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
***LYCOMING DIV., AVCO MFG. CORP.**
Metals & Controls Corp.
Henry & Miller Industries, Inc.
Precision Electroplating Co.
Sel-Rex Corp.
Standard Metals Corp.

PLATING, TIN ZINC

Aerodex, Inc.
Cohan Epner Co. Inc.
General Railway Signal Co.
Metals & Controls Corp.
Henry & Miller Industries, Inc.

PROPELLANT CASES, SOLID ROCKET

American Aerophysics Corp.
American Car & Foundry Div., ACF Industries, Inc.
American Rocket Co.
American Welding & Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
G. W. Galloway Co.
Goodyear Aircraft Corp.
***GRAND CENTRAL ROCKET CO.**
Kelsey-Hayes Co.
Ladish Co.
Lamtex Industries, Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Parish Pressed Steel, Div.-Dana Corp.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Resdel Corp.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
H. I. Thompson Fiber Glass Co.
Thompson Products, Inc.
Turbo Dynamics Corp.
Western Arc Welding, Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

PROPELLANT TANKS

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc.
American Aerophysics Corp.
American Car & Foundry Div., ACF Industries, Inc.
***COOPER DEVELOPMENT CORP.**
D. K. Mfg. Co.
G. W. Galloway Co.
Joclin Mfg. Co.
Herrick L. Johnston, Inc.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
***LYCOMING DIV., AVCO MFG. CORP.**
Menasco Mfg. Co.
Parish Pressed Steel, Div.-Dana Corp.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Reaction Motors, Inc.
Rohr Aircraft Corp.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Solar Aircraft Co.
Thompson Products, Inc.
United States Chemical Milling Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
Western Arc Welding, Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

PROPELLANTS, LIQUID ROCKET

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc
American Rocket Co.
Callery Chemical Co.
Delta Chemical Works, Inc.
Esso Standard Oil Co.
Food Machinery & Chemical Corp., Ordnance Div.
Fulton-Irgon Corp., The
Hercules Powder Co.
Herrick L. Johnston, Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Thompson Products, Inc.

PROPELLANTS, SOLID ROCKET

American Rocket Co.
Anderson, Greenwood & Co.
Atlantic Research Corp.
Callery Chemical Co.
***COOPER DEVELOPMENT CORP.**
Delta Chemical Works, Inc.
Fulton-Irgon Corp., The
B. F. Goodrich Aviation Products
***GRAND CENTRAL ROCKET CO.**
Hercules Powder Co.
Oerlikon Tool & Arms Corp. of America
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Propellex Chemical Corp.
Redstone Arsenal Research Div., Rohm & Haas Co.
Thompson Products, Inc.
Topper Mfg. Co., Inc.
Turbo Dynamics Corp.

PROPULSION SYSTEMS

American Rocket Co.
American Welding & Mfg. Co., The
Atco Pully Corp.
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Fulton-Irgon Corp., The
***GRAND CENTRAL ROCKET CO.**
Hercules Powder Co.
Joclin Mfg. Co.
Marquardt Aircraft Co.
McCormick Selph Associates
Propellex Chemical Corp.
Reaction Motors, Inc.
Redstone Arsenal Research Div., Rohn & Haas Co.
Rocketdyne Div., North American Aviation, Inc.
Thompson Products Inc.

PULSE JET ENGINES

Marquardt Aircraft Co.
Ryan Aeronautical Co.

PUMP SYSTEM, FLUID METERING

Applied Dynamics Corp.
Bendix Products Div., Bendix Aviation Corp.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
National Airoil Burner Co.
Milton Roy Co.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Thompson Products, Inc.
Whittaker Controls, Div.-Telecomputing Corp.

PUMPS

Bendix Products Div., Bendix Aviation Corp.
Christie Machine Works
Collins Engrg. Corp.
Consolidated Elecrtodynamics Corp.
***CORNELIUS CO., THE**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Eco Engrg. Co.
Electronic Communications, Inc.
Food Machinery & Chemical Corp., Ordnance Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
B. H. Hadley, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Lear, Inc.
Gerard G. Leeds Co., Inc.
National Airoil Burner Co.
New York Air Brake Co., The, Watertown Div.
Reaction Motors Inc.
Research Appliance Co.
Rocketdyne Div., North American Aviation, Inc.
Milton Roy Co.
***STAINLESS PROCESSING DIV.,-WALL COLMONOY CORP.**
Task Corp.
Vickers Inc., Div.-Sperry Rand
Wayne Pump Co., The

Air

Aro Equipment Corp., The
Champion Pneumatic Machinery Co.
***CORNELIUS CO., THE**
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
***EASTERN INDUSTRIES, INC.**
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Kemp Aero Products, Div.-Kemp Inc.
Lear, Inc.
M. C. Mfg. Co.
Nash Engrg. Co., The
Pesco Products Div.-Borg-Warner Corp.
Research Appliance Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Task Corp.

Alcohol

Blackmer Pump Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
***EASTERN INDUSTRIES, INC.**
Food Machinery & Chemical Corp., Ordnance Div.
Kemp Aero Products, Div.-Kemp Inc.
Kerns Mfg. Corp.
Lear, Inc.
Nash Engrg. Co., The
Pesco Products Div.—Borg-Warner Corp.
Research Appliance Co.
Milton Roy Co.
Task Corp.
Wayne Pump Co., The
Wright Aeronautical Div., Curtiss-Wright Corp.

Booster

Bendix Products Div., Bendix Aviation Corp.
*EASTERN INDUSTRIES, INC.
Food Machinery & Chemical Corp., Ordnance Div.
Kerns Mfg. Corp.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Nash Engrg. Co., The
Pesco Products Div.-Borg-Warner Corp.
Thompson Products, Inc.
Wells Industries Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Combination Air and Hydraulic

Bendix Products Div., Bendix Aviation Corp.
*CORNELIUS CO., THE
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Haskell Engrg. & Supply Co.
Oil-Dyne, Inc.
Pesco Products Div.-Borg-Warner Corp.
Pyles Industries, Inc.
Research Appliance Co.
Milton Roy Co.
Sprague Engrg. Corp.
Task Corp.
Wells Industries Corp.

Fuel

Blackmer Pump Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
*EASTERN INDUSTRIES, INC.
Electric Auto-Lite Co., The
Electronic Communications, Inc.
Food Machinery & Chemical Corp., Ordnance Div.
*GREER HYDRAULICS, INC.
Hupp Aviation Co.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kerns Mfg. Corp.
Lear, Inc.
Marquardt Aircraft Co.
Nash Engrg. Co., The
National Airoil Burner Co.
W. H. Nichols Co.
Pesco Products Div.—Borg-Warner Corp.
Research Appliance Co.
Rocketdyne Div., North American Aviation, Inc.
Sier-Bath Gear & Pump Co., Inc.
Stewart-Warner Corp.
Stratos, Div.—Fairchild Engine & Airplane Corp.
Thompson Products, Inc.
Vickers Inc., Div.—Sperry Rand
Wayne Pump Co., The
Whittaker Controls, Div.—Telecomputing Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Hydraulic, Fixed Displacement

American Brake Shoe Co., Kellogg Div.
Applied Dynamics Corp.
Bendix Products Div., Bendix Aviation Corp.
Champion Airquipment Inc.
*COMMERCIAL SHEARING & STAMPING CO.
*CORNELIUS CO., THE
*EASTERN INDUSTRIES, INC.
*GREER HYDRAULICS, INC.
Lear, Inc.
New York Air Brake Co., The, Watertown Div.
Oil-Dyne, Inc.
Pesco Products Div.—Borg-Warner Corp.
H. K. Porter Inc.
Research Appliance Co.
Milton Roy Co.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Vickers, Inc., Div.—Sperry Rand
Whittaker Controls, Div.—Telecomputing Corp.

Hydrogen Peroxide

Blackmer Pump Co.
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Kemp Aero Products, Div.—Kemp Inc.
Lear, Inc.
Pesco Products Div.—Borg-Warner Corp.
Research Appliance Co.
Milton Roy Co.
Whittaker Controls, Div.—Telecomputing Corp.

Liquid Nitrogen

Air Products, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
ARO Equipment Corp., The
Food Machinery & Chemical Corp., Ordnance Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.—Kemp Inc.
Pesco Products Div.—Borg-Warner Corp.
Reaction Motors, Inc.
Rocketdyne Div., North American Aviation, Inc.
*RYAN INDUSTRIES
Stratos, Div.—Fairchild Engine & Airplane Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Air Products Co.
Task Corp.
Thompson Products, Inc.
Whittaker Controls, Div.—Telecomputing Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Liquid Oxygen

Air Products, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
ARO Equipment Corp., The
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.—Kemp Inc.
Pesco Products Div.—Borg-Warner Corp.
Reaction Motors, Inc.
Rocketdyne Div., North American Aviation, Inc.
*RYAN INDUSTRIES
Stratos, Div.—Fairchild Engine & Airplane Corp.
Sunstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Air Products Co.
Task Corp.
Thompson Products, Inc.
Whittaker Controls, Div.-Telecomputing Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Metering

*EASTERN INDUSTRIES, INC.
Kemp Aero Products, Div.-Kemp Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
W. H. Nichols Co.
Research Appliance Co.
Milton Roy Co.
Whittaker Controls, Div.—Telecomputing Corp.

Oil

Applied Dynamics Corp.
Blackmer Pump Co.
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
*EASTERN INDUSTRIES, INC.
Hupp Aviation Co.
Lear, Inc.
National Airoil Burner Co.
W. H. Nichols Co.
Oil-Dyne, Inc.
Research Appliance Co.
Milton Roy Co.
Sier-Bath Gear & Pump Co., Inc.
Stewart-Warner Corp.
Sundstrand Aviation, Div.—Sundstrand Machine Tool Co.
Wayne Pump Co., The
Wittaker Controls, Div.—Telecomputing Corp.

Speed Density Metering

Bendix Products Div., Bendix Aviation Corp.

Transfer

Applied Dynamics Corp.
Blackmer Pump Co.
General Scientific Equipment Co.
Herrick L. Johnston, Inc.
Lear, Inc.
Nash Engrg. Co., The
National Airoil Burner Co.
Pesco Products Div.—Borg-Warner Corp.
Reaction Motors, Inc.
Research Appliance Co.
*RYAN INDUSTRIES
Stewart-Warner Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Task Corp.
Thompson Products, Inc.
Vickers Inc., Div.—Sperry Rand
Wayne Pump Co., The
Whittaker Controls, Div.—Telecomputing Corp.

Turbine

Christie Machine Works
Continental Aviation & Engrg. Corp.
*EASTERN INDUSTRIES, INC.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Lear, Inc.
Marquardt Aircraft Co.
Reaction Motors, Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Whittaker Controls, Div.—Telecomputing Corp.

Vacuum

ARO Equipment Corp., The
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
*CORNELIUS CO., THE
*EASTERN INDUSTRIES, INC.
Eisler Engrg. Co., Inc.
Green Rectifier Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
Lear, Inc.
Gerard G. Leeds Co., Inc.
NRC Equipment Corp.
Nash Engrg. Co., The
National Airoil Burner Co.
Pesco Products Div.—Borg-Warner Corp.
Schutte & Koerting Co.
F. J. Stokes Corp.
Veeco Vacuum Corp.

Water Injection

Bendix Products Div., Bendix Aviation Corp.
Food Machinery & Chemical Corp., Ordnance Div.
Lear, Inc.
Pesco Products Div.—Borg-Warner Corp.
Milton Roy Co.
Thompson Products, Inc.
Whittaker Controls, Div.—Telecomputing Corp.

Wobble

Bendix Products Div., Bendix Aviation Corp.
Lear, Inc.
Oil-Dyne, Inc.

QUARTZ, FUSED

*BAUSCH & LOMB OPTICAL CO.
Bram Metallurgical & Chemical Co.
Corning Glass Works
Davidson Mfg. Co.
Delta Chemical Works, Inc.
Hammett Electric Co.
Kemlite Laboratories, Inc.
Mica Fabricating Co.
Thermal American Fused Quartz Co., Inc.
Ultra-Violet Products, Inc.

RADIATORS, COOLANT

Dunham-Bush Inc.
Trane Co., The

RADIATORS, ENGINE-COOLING

Dunham-Bush Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Trane Co., The
*UNITED AIRCRAFT PRODUCTS, INC.

RADIATORS, OIL-COOLING

Dunham-Bush Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Trane Co., The
*UNITED AIRCRAFT PRODUCTS, INC.

RADIOACTIVE STAK

Nuclear Corp. of America, Inc.

RAMJET ENGINES

American Welding & Mfg. Co., The
Anderson, Greenwood & Co.
Continental Aviation & Engrg. Corp.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Marquardt Aircraft Co.
Ryan Aeronautical Co.
Smith-Morris Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

REACTORS, SATURABLE

American Research & Mfg. Corp.
Bendix Products Div., Bendix Aviation Corp.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hermetic Seal Transformer Co., Div.,-Southwestern Industrial Electronics
Lenkurt Electric Co., Inc.
Southwestern Industrial Electronics Co.
Sprague Engrg. Corp.
Telectro Industries Corp.
Tresco, Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

REDUCERS, SHAFT

American Flexible Coupling Div., Zurn Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Hupp Aviation Co.
Robot Appliances Inc.

REFRIGERATION EQUIPMENT, AIRBORNE

Aireco, Inc.
Bar-Ray Products, Inc.
Carrier Corp.
Dunham-Bush Inc.
*EASTERN INDUSTRIES, INC.
Ellis & Watts Products, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Ready Power Co., The

Stratos, Div.-Fairchild Engine & Airplane Corp.
Telectro Industries Corp.
Trane Co., The
*__UNITED AIRCRAFT PRODUCTS, INC.__

REGULATORS

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Air Speed Tool Co.
Airborne Research & Development Corp.
Alar Products, Inc.
American Research & Mfg. Corp.
Arkwin Industries, Inc.
Bogue Electric Mfg. Co.
Bridgwater Machine Co.
CDC Control Services, Inc.
Consolidated Electrodynamics Corp.
*__CORNELIUS CO., THE__
Davenport Mfg. Co.
Futurecraft Corp.
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
*__INTERELECTRONICS CORP.__
*__JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.__
Kemp Aero Products, Div.-Kemp Inc.
*__WALLACE O. LEONARD, INC.__
Minneapolis-Honneywell Regulator Co., Ordnance Div.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Philadelphia Scientific Glass Co.
Pioneer-Central Div., Bendix Aviation Corp.
Reaction Motors, Inc.
Rocketdyne Div., North American Aviation, Inc.
Milton Roy Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Air Combustion

Accessory Products Co., Div.-Textron Inc.
Arkwin Industries, Inc.
CDC Control Services, Inc.
Clary Dynamics
Futurecraft Corp.
Hagan Chemicals & Controls, Inc.
*__JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.__
Whittaker Controls, Div.-Telecomputing Corp.

Air Pressure

Accessory Products Co., Div.-Textron Inc.
Air Products, Inc.
Air Speed Tool Co.
Airborne Research & Development Corp.
Alco Valve Co.
Altair Inc.
Arkwin Industries, Inc.
ARO Equipment Corp., The
Bridgeport Brass Co.
Bridgwater Machine Co.
CDC Control Services, Inc.
A. W. Cash Co.
Clary Dynamics
Consolidated Controls Corp
*__CORNELIUS CO., THE__
Devilbiss Co., The
G. M. Dykes Iron Works, Inc
Fischer & Porter Co.
Futurecraft Corp.
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
General Controls Co.
*__GREER HYDRAULICS, INC.__
Hagan Chemicals & Controls, Inc.
Walter J. Hyatt Co., The
*__JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.__
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div
Lear, Inc.
*__WALLACE O. LEONARD, INC.__
M. C. Mfg. Co.
*__MAROTTA VALVE CORP.__
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Scientific Instrument Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Tactair Valve Div.-Aircraft Products Co.
*__UNITED AIRCRAFT PRODUCTS, INC.__
Vap-Air Div., Vapor Heating Corp.
Vinson Mfg. Co. Inc.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Coolant

Accessory Products Co., Div.-Textron Inc.
Arkwin Industries, Inc.
CDC Control Services, Inc.
Clary Dynamics
*__EASTERN INDUSTRIES, INC.__
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
Kemp Aero Products, Div.-Kemp Inc.
Research Controls
*__UNITED AIRCRAFT PRODUCTS, INC.__
Whittaker Controls, Div.-Telecomputing Corp.

Demand Oxygen

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Arkwin Industries, Inc.
ARO Equipment Corp., The
CDC Control Services, Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
General Scientific Equipment Co.
Kemp Aero Products, Div.-Kemp Inc.
*__WALLACE O. LEONARD, INC.__
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Fuel Flow

Accessory Products Co., Div.-Textron Inc.
Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Arkwin Industries, Inc.
CDC Control Services, Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Dynamic Controls Corp.
*__EASTERN INDUSTRIES, INC.__
Eddington Metal Specialty Co.
Fischer & Porter Co.
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
*__GREER HYDRAULICS, INC.__
Gulton Industries, Inc.
Walter J. Hyatt Co., The
Kemp Aero Products, Div.-Kemp Inc.
*__WALLACE O. LEONARD, INC.__
*__MAROTTA VALVE CORP.__
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Potter Aeronautical Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
Research Controls
Servomechanisms Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Thompson Products, Inc.
Ultradyne, Inc.
*__UNITED AIRCRAFT PRODUCTS, INC.__
United Control Corp.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Fuel Pressure

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Arkwin Industries, Inc.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
*__EASTERN INDUSTRIES, INC.__
Fischer & Porter Co.
Futurecraft Corp.
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
*__GREER HYDRAULICS, INC.__
Walter J. Hyatt Co., The
Kemp Aero Products, Div.-Kemp Inc.
*__WALLACE O. LEONARD, INC.__
*__MAROTTA VALVE CORP.__
Mercury Rad Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
Scientific Instrument Co.
Servomechanisms Inc.
Thompson Products, Inc.
Ultradyne, Inc.
*__UNITED AIRCRAFT PRODUCTS, INC.__
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Hydraulic Pressure

Aero Supply Mfg. Co., Inc.
Altair Inc.
Arkwin Industries, Inc.
Bridgwater Machine Co.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Clary Dynamics
Consolidated Controls Corp.
*__EASTERN INDUSTRIES, INC.__
Fischer & Porter Co.
Futurecraft Corp.
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS__
*__GREER HYDRAULICS, INC.__
Walter J. Hyatt Co., The
Hydra-Power Corp.
Kemp Aero Products, Div.-Kemp Inc.
*__WALLACE O. LEONARD, INC.__
M. C. Mfg. Co.
*__MAROTTA VALVE CORP.__
Minneapolis-Honeywell Regulator Co., Indust. Div
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Milton Roy Co.
Scientific Instrument Co.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
Ultradyne, Inc.
*__UNITED AIRCRAFT PRODUCTS, INC.__
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd
Whittaker Controls, Div.-Telecomputing Corp.

Liquid Level

Accessory Products Co., Div.-Textron Inc.
Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
ARO Equipment Corp., The
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
Fischer & Porter Co.
Gulton Industries Inc
Kemp Aero Products, Div.-Kemp Inc.
Leeds & Northrup Co.
*__WALLACE O. LEONARD, INC.__
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co Indust. Div.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Victory Engineering Corp.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Manifold Pressure

Accessory Products Co., Div.-Textron Inc.
Arkwin Industries, Inc.
CDC Control Services, Inc.
Fischer & Porter Co.
Kemp Aero Products, Div.-Kemp Inc.
Parker Aircraft Co.
Whittaker Controls, Div.-Telecomputing Corp.

Oil Cooler

Arkwin Industries, Inc.
CDC Control Services, Inc.
*__EASTERN INDUSTRIES, INC.__
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
*__UNITED AIRCRAFT PRODUCTS, INC.__
Vap-Air Div., Vapor Heating Corp.
Vinson Mfg. Co., Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Oil Pressure

Accessory Products Co., Div.-Textron Inc.
CDC Control Services, Inc.
A. W. Cash Co.
Consolidated Controls Corp.
*__EASTERN INDUSTRIES, INC.__
Fischer & Porter Co.
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
*__GREER HYDRAULICS, INC.__
Hagan Chemicals & Controls, Inc.
Walter J. Hyatt Co., The
Kemp Aero Products, Div.-Kemp Inc.
*__WALLACE O. LEONARD, INC.__
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*__UNITED AIRCRAFT PRODUCTS, INC.__
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Oil Pump Flow

CDC Control Services, Inc.
*__EASTERN INDUSTRIES, INC.__
Fischer & Porter Co.
*__GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__

*GREER HYDRAULICS, INC.
Kemp Aero Products, Div.-Kemp Inc.
*WALLACE O. LEONARD, INC.
Ozone Metal Products Corp.
Research Controls
*UNITED AIRCRAFT PRODUCTS, INC.
Whittaker Controls, Div.-Telecomputing Corp.

Oil Temperature

Arkwin Industries, Inc.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
Consolidated Controls Corp.
*EASTERN INDUSTRIES, INC.
Fenwal Inc.
Fischer & Porter Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hagan Chemicals & Controls, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Scientific Instrument Co.
*UNITED AIRCRAFT PRODUCTS, INC.
Vap-Air Div., Vapor Heating Corp.
Whittaker Controls, Div.-Telecomputing Corp.

Oxygen

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Air Products, Inc.
Airborne Research & Development Corp.
ARO Equipment Corp., The
CDC Control Services, Inc.
A. W. Cash Co.
Clary Dynamics
G. M. Dykes Iron Works, Inc.
Fischer & Porter Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Scientific Equipment Co.
Kemp Aero Products, Div.-Kemp Inc.
*WALLACE O. LEONARD, INC.
*MAROTTA VALVE CORP.
Oxygen Equipment & Service Co.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Progressive Research & Development Co., Inc.
Puritan Compressed Gas Corp., Aviation Div.
Scott Aviation Corp.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Temperature

Barber-Colman Co.
Bar-Ray Products, Inc.
CDC Control Services, Inc.
Cardinal Instrumentation Corp.
A. W. Cash Co.
Consolidated Controls Corp.
Dynamic Controls Corp.
*EASTERN INDUSTRIES, INC.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fairfield Engineering Corp.
Fenwal Inc.
Fischer & Porter Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hagan Chemicals & Controls, Inc.
E. Vernon Hill & Co.
Leeds & Northrup Co.
Metals & Controls Corp.
Minneapolis-Honeywell Regulator Co., Areonautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Parker Aircraft Co.
Philadelphia Scientific Glass Co.
Powers Regulator Co., The
Pyrometer Instrument Co., Inc.
Resdel Engrg. Corp.
Scientific Instrument Co.
*STEVENS MFG. CO., INC.
Thermo Electric Co., Inc.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vap-Air Div., Vapor Heating Corp.
Victory Engineering Corp.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Vacuum Systems

Accessory Products Co., Div.-Textron Inc.
ARO Equipment Corp., The
CDC Control Services, Inc.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Green Rectifier Co.
International Pump & Machine Works
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Gerard G. Leeds Co., Inc.
*WALLACE O. LEONARD, INC.
NRC Equipment Corp.
Process & Instruments
Research Appliance Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Voltage Regulators and Stabilizers

Abrams Instrument Corp.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Carleton Aviation Co., Inc.
Central Transformer Co.
Curtiss-Wright Corp., Electronics Div.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Electric Regulator Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Controls Co.
General Electric Co., Apparatus Sales Div.
General Magnetics, Inc.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
Helipot Corp.
Instruments Div.-Philips Electronics, Inc.
*INTERELECTRONICS CORP.
Gerard G. Leeds Co., Inc.
Lumen, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Parker Aircraft Co.
Resdel Engrg. Corp.
Southwestern Industrial Electronics Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Tel-Instrument Electronics Corp.
Thompson Products, Inc.
Trans Electronics, Inc.
Ultradyne, Inc.
Universal Electronics Co.
Varo Mfg. Co.
Wacline, Inc.
Western Electro-Acoustic Lab.
*WESTINGHOUSE ELECTRIC CORP.
Whittaker Controls, Div.-Telecomputing Corp.
Wickes Engrg. & Construction Co. Inc.

Water Injection

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
CDC Control Services, Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Eddington Metal Specialty Co.
Research Controls
Milton Roy Co.
Whittaker Controls, Div.-Telecomputing Corp.

RESERVOIRS, HYDRAULIC SYSTEMS

Accessory Products Co., Div.-Textron Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Applied Dynamics Corp.
Arkwin Industries, Inc.
Bridgwater Machine Co.
Calcor Corp., Aircraft Div.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
*COOPER DEVELOPMENT CORP.
*CORNELIUS CO., THE
*DALMO VICTOR CO., DIV.-TEXTRON INC.
*DIVERSEY ENGRG. CO.
*ELECTROL INC.
G. W. Galloway Co.
*GREER HYDRAULICS, INC.
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Hydra-Power Corp.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Ryan Aeronautical Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co., Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Wells Industries Corp.

RESERVOIRS, PNEUMATIC SYSTEMS

*AMERICAN MACHINE & FOUNDRY CO.
Arkwin Industries, Inc.
Bridgwater Machine Co.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
*COOPER DEVELOPMENT CORP.
*CORNELIUS CO., THE
*DALMO VICTOR CO., DIV.-TEXTRON INC.
*DIVERSEY ENGRG. CO.
*GREER HYDRAULICS, INC.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Walter Kidde & Co., Inc., Aviation Div.
Menasco Mfg. Co.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
Ryan Aeronautical Co.
Thompson Products, Inc.
Vinco Corp.
Vinson Mfg. Co., Inc.
Wells Industries Corp.

RESTRICTORS, HYDRAULIC SYSTEMS

*AMERICAN MACHINE & FOUNDRY CO.
Arkwin Industries, Inc.
Bridgwater Machine Co.
*ELECTROL INC.
*GREER HYDRAULICS, INC.
Hydra-Power Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kemp Aero Products, Div.-Kemp Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
A. U. Stone & Co., Inc.
Thompson Products, Inc.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

RHODIUM

Allied Research & Engrg. Div.-Allied Record Mfg. Co.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Cohan Epner Co. Inc.
Delta Chemical Works, Inc.
Wilbur B Driver Co.
Eastern Smelting & Refining Corp.
Electro Tec Corp., Virginia Div.
Goldsmith Brothers Smelting & Refining Co.
Harper-Leader, Inc.
Metals & Controls Corp.
Sel-Rex Corp.
Western Gold & Platinum

RINGS

Advanced Products Co., The
American Welding & Mfg. Co., The
Anchor Packing Co., The
Auburn Mfg. Co., The
Belmont Smelting & Refining Works, Inc.
Bridgwater Machine Co.
California Aircraft Products
Chicago-Allis Mfg. Corp.
Enflo Corp.
Gatke Corp.
Green, Tweed & Co.
Walter Lee Chemical Corp.
Leetronics, Inc.
Ryan Aeronautical Co.
St. Marys Carbon Co.
U. S. Hammered Piston Ring Co., Inc.
Western Arc Welding, Inc.

Carbon Packing

American Welding & Mfg. Co., The
Carbone Corp., The
La Pointe Industries Inc.
Morganite, Inc.
Ohio Carbon Co., The
St. Marys Carbon Co.
U. S. Hammered Piston Ring Co., Inc.

Clamping

American Welding & Mfg. Co., The
G. M Dykes Iron Works, Inc.
Walter K. Jaros, Aircrafters
Kelsey-Hayes Co.
La Pointe Industries Inc.
Roll Formed Products Co.
Ryan Aeronautical Co.
Specialty Products Corp.
Western Arc Welding, Inc.

Collector

Amplex Div.-Chrysler Corp.
G. M. Dykes Iron Works, Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Gibson Electric Co.
Graphite Metallizing Corp.
Iron Fireman Mfg. Co., Electronics Div.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Ryan Aeronautical Co.
Tricon Mfg. Co.

Expansion

***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
U. S. Hammered Piston Ring Co., Inc.

Hydraulic Back-up

***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Auburn Mfg. Co., The
Crane Packing Co.
Dumont Aviation Associates
Fluorocarbon Co. Inc., The
Gatke Corp.
General Gasket Inc.
Green, Tweed & Co.
Halogen Insulator & Seal Corp.
E. F. Houghton & Co.
Kasar Mfg. & Distributing Co., Inc.
La Pointe Industries Inc.
Linear, Inc.
Resistoflex Corp.
Rogers Corp.
Rubbercraft Corp. of California
Sparta Mfg. Co.
U. S. Hammered Piston Ring Co., Inc.

Oil Sealing

Advanced Products Co., The
American Welding & Mfg. Co., The
Auburn Mfg. Co., The
Chicago-Allis Mfg. Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Crane Packing Co.
Emerson Plastics Corp.
Enflo Corp.
Fluorocarbon Co. Inc., The
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
General Gasket Inc.
Graphite Metallizing Corp.
Green, Tweed & Co.
Halogen Insulator & Seal Corp.
Walter K. Jaros Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Parker-Hannifin Corp.
Roberts Toledo Rubber Co., The
Rubbercraft Corp. of California
St. Marys Carbon Co.
Simplex Piston Ring Mfg. Co.
Smith-Morris Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.
Vibra Seal Corp.
Victor Mfg. & Gasket Co.

Retainer

***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Anchor Packing Co., The
Continental Diamond Fibre Corp Sub—The Budd Co.
Corbin Products Div.
Dumont Aviation Associates
Enflo Corp.
Fluorocarbon Co. Inc, The
Green, Tweed & Co.
Hunter Spring Co.
Hupp Aviation Co.
Industrial Retaining Ring Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kelsey-Hayes Co.
La Pointe Industries Inc.
Roll Formed Products Co.
Simonds Saw & Steel Co.
Smith-Morris Corp.
Standard Locknut & Lockwasher Inc.
U. S. Hammered Piston Ring Co., Inc.
Western Arc Welding, Inc.

Scraper

American Welding & Mfg. Co., The
Corbin Products Div.
Fluorocarbon Co. Inc., The
Green, Tweed & Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Linear, Inc.
Smith-Morris Corp.
U. S. Hammered Piston Ring Co., Inc.

Sealing

Advanced Products Co., The
American Welding & Mfg. Co., The
Anchor Packing Co., The
Auburn Mfg. Co., The
***AUTOMATIC & PRECISION MFG. CO.**
Belmont Smelting & Refining Works, Inc.
Chicago-Allis Mfg. Corp.
Continental Diamond Fibre Corp. Sub—The Budd Co.
Crane Packing Co.
Emerson Plastics Corp.
Fluorocarbon Co. Inc., The
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
General Gasket Inc.
Graphite Metallizing Corp.
Green, Tweed & Co.
E. F. Houghton & Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Kennametal Inc.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Morganite, Inc.
Parker-Hannifin Corp.
St. Marys Carbon Co.
Simplex Piston Ring Mfg. Co.
Smith-Morris Corp.
Turbo Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.
Victor Mfg. & Gasket Co.

Shock Absorber

Airflyte Electronics Co.
American Printed Circuits Co., Inc.
Auburn Mfg. Co., The
Crane Packing Co.
Fluorocarbon Co. Inc., The
General Cable Corp.
Green, Tweed & Co.
La Pointe Industries Inc.
Rubbercraft Corp. of California
Uniwave, Inc.

Slip

Airflyte Electronics Co.
***AMERICAN MACHINE & FOUNDRY CO.**
American Printed Circuits Co., Inc.
Dumont Aviation Associates
G. M. Dykes Iron Works, Inc.
Electro Tec Corp.
Electro Tec Corp., Virginia Div.
Enflo Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Gibson Electric Co.
Graphite Metallizing Corp.
Handy & Harman
Iron Fireman Mfg. Co., Electronics Div.
Kelsey-Hayes Co.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
***LYCOMING DIV., AVCO MFG. CORP.**
Metals & Controls Corp.
Servonic Instruments, Inc.
Simonds Saw & Steel Co.
***SLIP RING CO. OF AMERICA**
Superior Carbon Products, Inc.
Telectro Industries Corp.
Tricon Mfg. Co.
U. S. Hammered Piston Ring Co., Inc.
Uniwave, Inc.

Slip & Brush Assemblies

Airflyte Electronics Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Carbone Corp., The
Electro Tec Corp.
Electro Tec Corp., Virginia Div.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Graphite Metallizing Corp.
Iron Fireman Mfg. Co., Electronics Div.
Kelsey-Hayes Co.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
***LYCOMING DIV., AVCO MFG. CORP.**
Magnasync Mfg. Co., Ltd.
Servonic Instruments, Inc.
***SLIP RING CO. OF AMERICA**
Superior Carbon Products, Inc.
Telectro Industries Corp.

ROCKETS

ACF Industries, Inc., Advanced Products Div.
***AMERICAN MACHINE & FOUNDRY CO.**
American Rocket Co.
American Welding & Mfg. Co., The
Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
G. W. Galloway Co.
Goodyear Aircraft Corp.
***GRAND CENTRAL ROCKET CO.**
Hahn & Clay
Hamilton Watch Co., Military Products Div.
Hercules Powder Co.
McCormick Selph Associates
Oerlikon Tool & Arms Corp. of America
Propellex Chemical Corp.
Reaction Motors, Inc.
Redstone Arsenal Research Div., Rohm & Haas Co.
Thompson Products, Inc.
Turbo Dynamics Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

ROD END BEARINGS

Allied Plastics Supply Corp.
Chain Belt Co.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Freeman Co., The
Walter K. Jaros, Aircrafters
Walter Lee Chemical Corp.
Raway Bearing Co.
Southwest Products Co.
Western Arc Welding, Inc.

ROTATORS

Thompson Products, Inc.
Wind Turbine Co.

ROTOR ASSEMBLIES, GAS TURBINE ENGINE

***AMERICAN MACHINE & FOUNDRY CO.**
Bridgwater Machine Co.
Ex-Cell-O Corp.
Houston Fearless Corp.
Kelsey-Hayes Co.
Kerns Mfg. Corp.
La Pointe Industries Inc.
Solar Aircraft Co.
Sundstrand Turbo Div., Sunstrand Machine Tool Co.
Talley Corp., The
Thompson Products, Inc.
Turbo Products, Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
***WESTINGHOUSE ELECTRIC CORP.**

ROTOR CASTINGS

American Brake Shoe Co.
Morris Bean & Co.
Thompson Products, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

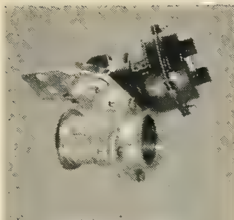
ROTORS

American Electronics, Inc.
Christie Machine Works
Eicor Div.-F. L. Jacobs Co.
Houston Fearless Corp.
La Pointe Industries Inc.
Talley Corp., The
Thompson Products, Inc.
Turbo Products, Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
***WESTINGHOUSE ELECTRIC CORP.**

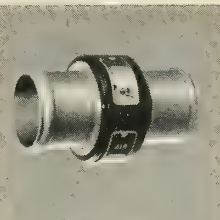
SCREW MACHINE PRODUCTS

Aero Supply Mfg. Co., Inc.
Aerotron Supply Co.
Affiliated Screw Products Co.
All American Aircraft Products, Inc.
Allied Plastics Supply Corp.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
Amatom Electronic Hardware Co. Inc
***AMERICAN MACHINE & FOUNDRY CO.**
American Non Gran Bronze Co.
American Screw Co.
American Standard Products, Inc.
Arnolt Corp.
Auburn Spark Plug Co., Inc.
Bergen Carbide Co.
Bland Burner Co., The
Briles Mfg.
J. H. Bunnell & Co.
Century Fasteners Corp.
Chicago Screw Co., The, Div.-Standard Screw Co.
Circon Component Corp.
Clark Equipment Co.
Cole-Hersee Co.
Connector Corp. of America
Corbin Products Div.
Dalmore Corp.
Dayton Mfg. Co., Inc.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Eddington Metal Specialty Co.
Engineered Products Co., The
Ex-Cell-O Corp.
Federal Screw Products Inc.
Fluorocarbon Co. Inc., The
Freeman Co., The
Geartronics Corp.
General Components Inc.
General Findings & Supply Co., Industrial Div.
General Railway Signal Co.
Goe Engrg. Co.
Graflex, Inc.
Hamilton Watch Co., Military Products Div.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Herlo Engrg. Corp.
Alfred Hofmann & Co.
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
Lamson & Sessions Co., The
Leach & Garner Co., Industrial Div.
***LYCOMING DIV., AVCO MFG. CORP.**
J. A. Maurer, Inc.

Pneumatic controls

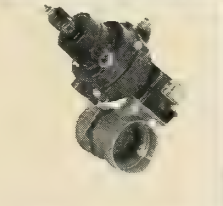

Modulating valves
244 types

FOR


Check valves
80 types

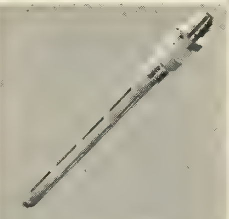
AIRCRAFT

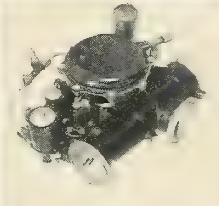
Relief pressure regulators
27 types

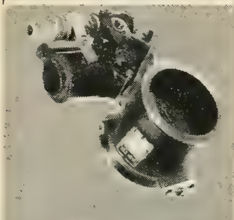

Ratio pressure regulators
16 types

Absolute pressure regulators
18 types

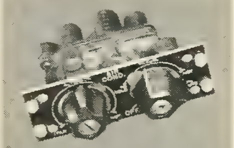
MISSILES


Thermostats
8 types

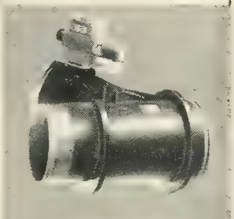

Flow regulators
28 types

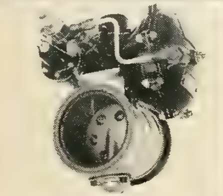

Shutoff valves
349 types

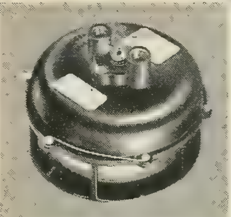
NUCLEONICS

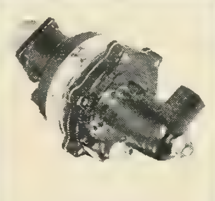

Temperature controls
20 types

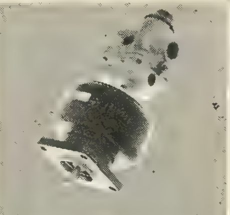
CRYOGENICS

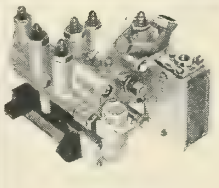

Mixing valves
25 types


Differential pressure
regulators
414 types


Compartment regulators
267 types


Pneumatic switches
10 types


Pneumatic governors
50 types


Pneumatic engine
computer-controllers
6 types

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Temperatures of the fluids (including gas and liquids) range from −400°F to +2000°F at pressures to +6000 psig. The units operate at any ambient pressure at ambient temperatures from −300°F to over +1000°F. Line diameters range from ⅛ inch to 15 inches.

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Permax Products Div., Chisholm-Ryder Co., Inc.
H. K. Porter Inc.
Precise Instrument Parts Co., A Corp.
Research Development Mfg. Inc.
St. Regis Paper Co.
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Sinclair Mfg. Co.
Skinner Precision Products
Herman D. Steel Co.
Wm. Steinen Mfg. Co.
Standard Locknut & Lockwasher Inc.
Technical Oil Tool Corp.
Titan Metal Mfg. Co.
Torrington Co., The
***UNITED AIRCRAFT PRODUCTS, INC.**
United Mfg. Co., The
Uniwave, Inc.
Vemaline Products Co.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Waltham Screw Co.
Wells Industries Corp.
Winchester-West. Div.-Olin Mathieson Chem. Corp.
Winder Aircraft Corp. of Fla.
J. H. Winn Inc.
Wright Aeronautical Div., Curtiss-Wright Corp.

SCREWS SELF-TAPPING

Aerotron Supply Co.
Affiliated Screw Products Co.
Allmetal Screw Products Co., Inc.
American Screw Co.
Century Fasteners Corp.
Corbin Products Div.
Dumont Aviation Associates
Federal Screw Products Inc.
Walter K. Jaros, Aircrafters
Lamson & Sessions Co., The
Napoleon Products Co., The
National Lock Co.
Reed & Prince Mfg. Co.
Republic Steel Corp.
Thompson-Bremer & Co.
Torrington Co., The
Waldom Electronics Inc.

SCREWS SET

Aerotron Supply Co.
Affiliated Screw Products Co.
Allen Mfg. Co.
Allmetal Screw Products Co., Inc.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Chicago Screw Co., The, Div.-Standard Screw Co.
Corbin Products Div.
Danly Machine Specialties, Inc.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Federal Screw Products Inc.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Walter K. Jaros, Aircrafters
Kasar Mfg. & Distributing Co., Inc.
National Lock Co.
Reed & Prince Mfg. Co.
Standard Pressed Steel Co.
Waldom Electronics Inc.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.

SCREWS, STANDARD

Aerotron Supply Co.
Affiliated Screw Products Co.
Allen Mfg. Co.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
American Screw Co.
Bland Burner Co., The
Briles Mfg.
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Chicago Screw Co., The, Div.-Standard Screw Co.
Corbin Products Div.
Danly Machine Specialties, Inc.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Federal Screw Products Inc.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
Walter K. Jaros, Aircrafters
Lamson & Sessions Co., The
Reed & Prince Mfg. Co.
Torrington Co., The
Waldom Electronics Inc.
Western Automatic Machine Screw Co., Div.-Standard Screw Co.

SEALERS, FUEL AND OIL TANK

Drilube Co.
General Cable Corp.
Horsey, Robson & Co., Inc.

SEALERS, NUCLEAR

Conax Corp.
Silicones Div.-Union Carbide Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**

SEALERS, PROTECTIVE

General Cable Corp.
Silicones Div.-Union Carbide Corp.

SEALING SERVICE HERMETIC

Automatic & Precision Mfg. Co.
Gits Brothers Mfg. Co.

SEALS

Advanced Products Co., The
Allied Plastics Supply Corp.
Anchor Packing Co., The
Auburn Spark Plug Co., Inc.
Carbone Corp., The
Consolidated Electrodynamics Corp.
Electrical Industries, Div.-Philips Electronics, Inc.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Gits Brothers Mfg. Co.
Koppers Co., Inc., Metal Products Div.
Walter Lee Chemical Corp.
Rubatex Div., Great American Industries Inc.
St. Marys Carbon Co.
Schlegel Mfg. Co.
Sealol Corp.
L. Sonneborn & Sons, Inc., Building Products Div.
Stein Seal Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Sylvania Electric Products Inc., Parts Div.
U. S. Hammered Piston Ring Co., Inc.
Vickers Inc., Div.-Sperry Rand
Victor Mfg. & Gasket Co.
Western Felt Works

Carbon

Carbone Corp., The
Ceramaseal, Inc.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Delta Chemical Works, Inc.
Gits Brothers Mfg. Co.
Graphite Metallizing Corp.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Magnetic Seal Corp.
Morganite, Inc.
Ohio Carbon Co., The
St. Marys Carbon Co.
Sealol Corp.
Simplex Piston Ring Mfg. Co.
Stein Seal Co.
Sundstrand Turbo Div., Sunstrand Machine Tool Co.
Superior Carbon Products, Inc.
U. S. Hammered Piston Ring Co., Inc.

Ceramic to Metal

Auburn Spark Plug Co., Inc.
Barium & Chemicals, Inc.
Bendix Products Div., Bendix Aviation Corp.
Consolidated Electrodynamics Corp.
Crane Packing Co.
Delta Chemical Works, Inc.
Diamonite Products Mfg. Co.
Gilmore Industries Inc.
Isolantite Mfg. Corp.
Kerns Mfg. Corp.
La Pointe Industries Inc.
Magnetic Seal Corp.
McCormick Selph Associates
Chester Morton Electronics Corp.
D. M. Steward Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Thermo Materials Inc.
U. S. Hammered Piston Ring Co., Inc.
Western Gold & Platinum

Dust Excluder

Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Chicago-Allis Mfg. Corp.
Flock Process Co. Inc.
General Cable Corp.
General Gasket Inc.
Walter Lee Chemical Corp.
Magnetic Seal Corp.
Rubatex Div., Great American Industries Inc.
Rubbercraft Corp. of California
Schlegel Mfg. Co.
U. S. Hammered Piston Ring Co., Inc.

Grease and Oil

Advanced Products Co., The
Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crane Packing Co.
Delta Chemical Works, Inc.
Dumont Aviation Associates
Emerson Plastics Corp.
General Cable Corp.
Gits Brothers Mfg. Co.
Green, Tweed & Co.
Kasar Mfg. & Distributing Co., Inc.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Magnetic Seal Corp.
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
Sealol Corp.
U. S. Hammered Piston Ring Co., Inc.
Western Felt Works

Hermetic and Pressurized

Barium & Chemicals, Inc.
Demornay Bonardi
Electrical Industries, Div.-Philips Electronics, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Garde Mfg. Co.
General Cable Corp.
Gilmore Industries Inc.
B. F. Goodrich Aviation Products
Joclin Mfg. Co.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Licon Div.-Illinois Tool Works
McCormick Selph Associates
Sealol Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.
Western Felt Works

Hydraulic

Advanced Products Co., The
Auburn Mfg. Co., The
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Emerson Plastics Corp.
Fluorocarbon Co. Inc., The
Gasket, Packing & Specialty Co., Inc.
General Cable Corp.
Green, Tweed & Co.
Halogen Insulator & Seal Corp.
E. F. Houghton & Co.
Joclin Mfg. Co.
Kasar Mfg. & Distributing Co., Inc.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Parker-Hannifin Corp.
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
Sealol Corp.
Simplex Piston Ring Mfg. Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Turbo Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.
Vickers Inc., Div.-Sperry Rand
Western Felt Works

Insulating

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Bacon Industries Inc.
Continental Diamond Fibre Corp., Sub—The Budd Co.
Diamonite Products Mfg. Co.
Emerson Plastics Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Garde Mfg. Co.
Gasket Packing & Specialty Co. Inc.
Isolantite Mfg. Corp.
Joclin Mfg. Co.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Schlegel Mfg. Co.
Seaman Products
Synthane Corp.
Union Asbestos & Rubber Co.
U. S. Hammered Piston Ring Co. Inc.

Metal-to-Glass

Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Barium & Cremicals, Inc.
L. L. Constantin & Co.
Corning Glass Works
Delta Chemical Works, Inc.
Demornay-Bonardi
Electrical Industries, Div.-Philips Electronics, Inc.
Fusite Corp.
Gilmore Industries Inc.

McCormick Selph Associates
Pacific Universal Products Corp.
Schlegel Mfg. Co.
Smooth-On Mfg. Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Sylvania Electric Products Inc., Parts Div.
U. S. Hammered Piston Ring Co., Inc.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America
Vacuum Tube Products Co. Inc.
*WESTINGHOUSE ELECTRIC CORP.
X-Pando Corp.

Missile

Advanced Products Co., The
Automatic & Precision Mfg. Co.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Emerson Plastics Corp.
Fluorocarbon Co. Inc., The
Green, Tweed & Co.
Joclin Mfg. Co.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Sealol Corp.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.

Oil

Advanced Products Co., The
Anchor Packing Co., The
Auburn Mfg. Co., The
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
Delta Chemical Works, Inc.
Dumont Aviation Associates
Emerson Plastics Corp.
General Cable Corp.
Green, Tweed & Co.
Joclin Mfg. Co.
Kasar Mfg. & Distributing Co., Inc.
Kickhaefer Mfg. Co.
Walter Lee Chemical Corp.
Magnetic Seal Corp.
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
Sealol Corp.
Simplex Piston Ring Mfg. Co.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.
Victor Mfg. & Gasket Co.
Western Felt Works

Pipe Joint

Advanced Products Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crane Packing Co.
Delta Chemical Works, Inc.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
Green, Tweed & Co.
Joclin Mfg. Co.
Johns-Manville Dutch Brand Div.
Walter Lee Chemical Corp.
Parker-Hannifin Corp.
Sealol Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
Vibra Seal Corp.
X-Pando Corp.

Pump—Mechanical

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
Emerson Plastics Corp.
General Cable Corp.
Green, Tweed & Co.
Joclin Mfg. Co.
Koppers Co., Inc., Metal Products Div.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Ohio Carbon Co., The
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
Sealol Corp.
Stein Seal Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.
Western Felt Works

Shaft

Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Carbone Corp., The
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
Emerson Plastics Corp.
Flexonics Corp.
Fluorocarbon Co. Inc., The
General Cable Corp.
Graphite Metallizing Corp.
Green, Tweed & Co.
Joclin Mfg. Co.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Morganite, Inc.
Neosil Products Co.
Ohio Carbon Co., The
St. Marys Carbon Co.
Sealol Corp.
Simplex Piston Ring Mfg. Co.
Stein Seal Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Thompson Products, Inc.
U. S. Hammered Piston Ring Co., Inc.
Vibra Seal Corp.
Victor Mfg. & Gasket Co.
Western Felt Works

Special Purpose

Advanced Products Co., The
Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Bacon Industries, Inc.
Carbone Corp., The
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Connecticut Hard Rubber Co., The
Emerson Plastics Corp.
General Cable Corp.
B. F. Goodrich Aviation Products
Green, Tweed & Co.
Joclin Mfg. Co.
Herrick L. Johnston, Inc.
Kemp Inc.
Kerns Mfg. Corp.
Kickhaefer Mfg. Co.
Koppers Co., Inc., Metal Products Div.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Rubatex Div., Great American Industries Inc.
St. Marys Carbon Co.
Schlegel Mfg. Co.
Sealol Corp.
Simplex Piston Ring Mfg. Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.

SHAFTS, FLEXIBLE

American Flexible Coupling Div., Zurn Industries, Inc.
Birnbach Radio Co., Inc.
B. W. Elliott Mfg. Co., Inc.
Geartronics Corp.
E. F. Johnson Co.
*F. W. STEWART CORP.
Stewart-Warner Corp.

SHAFTS, RIGID

Affiliated Screw Products Co.
American Flexible Coupling Div., Zurn Industries, Inc.
American Steel Foundries, Hammond Div.
Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dayton Mfg. Co., Inc.
Enflo Corp.
Engineered Products Co., The
Federal Machine Co. Inc.
Hupp Aviation Co.
E. F. Johnson Co.
Henry & Miller Industries, Inc.
Pic Design Corp., Sub—Benrus Watch Co., Inc.
Research Development Mfg. Inc.
Sier-Bath Gear & Pump Co., Inc.
United Mfg. Co., The
Wells Industries Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

SHAFTS, TURBINE

American Flexible Coupling Div., Zurn Industries, Inc.
Bridgwater Machine Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Houston Fearless Corp.
Ladish Co.
*LYCOMING DIV., AVCO MFG. CORP.
Merz Engrg., Inc.
Solar Aircraft Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
*WESTINGHOUSE ELECTRIC CORP.
Wright Aeronautical Div., Curtiss-Wright Corp.

SHIELDING

Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Bar-Ray Products, Inc.
Beaton & Corbin Mfg. Co., The
Belmont Smelting & Refining Works, Inc.
Enflo Corp.
Goodyear Aircraft Corp.
Hallett Mfg. Co.
Swedlow Plastics Co.
Zippertubing Co., The

Heat

Continental Diamond Fibre Corp., Sub.—The Budd Co.
Enflo Corp.
General Cable Corp.
Goodyear Aircraft Corp.
Hupp Aviation Co.
Smith-Morris Corp.
Swedlow Plastics Co.

Ignition

Airtron, Inc.
American Brass Co., American Metal Hose Div.
Auburn Mfg. Co., The
Beaton & Corbin Mfg. Co., The
Connecticut Hard Rubber Co., The
Co-Operative Industries, Inc.
Flexible Metal Hose Mfg. Co.
General Cable Corp.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
J. E. Menaugh Co.
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Skytronics
Titeflex, Inc.
Zippertubing Co., The

Lead

Alpha Metals, Inc.
Anchor Metal Co. Inc.
Bar-Ray Products, Inc.
Belmont Smelting & Refining Works, Inc.
Division Lead Co.
G. W. Galloway Co.
Gasket, Packing & Specialty Co. Inc.
Goldsmith Brothers Smelting & Refining Co.
Hallett Mfg. Co.
Zippertubing Co., The

Lead, Nuclear

Bar-Ray Products, Inc.
Division Lead Co.
G. W. Galloway Co.
Gasket, Packing & Specialty Co. Inc.
Telectro Industries Corp.
Wells Industries Corp.
Zippertubing Co., The

Magnetic

Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Shielding Inc.
Telectro Industries Corp.
Zippertubing Co., The

Radiation

Allied Plastics Supply Corp.
Barium & Chemicals, Inc.
Bar-Ray Products, Inc.
Belmont Smelting & Refining Works, Inc.
Canadian Radium & Uranium Corp.
Division Lead Co.
Fansteel Metallurgical Corp.
Garrett Corp., The, Air Cruisers Div.
General Cable Corp.
P. R. Mallory & Co. Inc.
Metallurgical Products Dept., General Electric Co.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Solar Aircraft Co.
Telectro Industries Corp.
Zippertubing Co., The

Radiation, Nuclear

Allied Plastics Supply Corp.
Aluminum Co. of America
American Agile Corp.
American Silver Co.
Anchor Metal Co., Inc.
Bar-Ray Products, Inc.
Belmont Smelting & Refining Works, Inc.
Corning Glass Works
Division Lead Co.
Garrett Corp., The, Air Cruisers Div.
Gasket, Packing & Specialty Co. Inc.
Metallurgical Products Dept., General Electric Co.
Norton Co.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Westlake Plastics, CrystalX Corp.
Zippertubing Co., The

. . . propulsion system

Solid

Continental Diamond Fibre Corp. Sub.—The Budd Co.
Shielding Inc.

SHIMS, ADJUSTING

Acme Mfg. & Gasket Co.
American Silver Co.
Auburn Mfg. Co., The
G. M. Dykes Iron Works, Inc.
Emerson Plastics Corp.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Gasket Inc.
Walter K. Jaros, Aircrafters
***LAMINATED SHIM CO.**
La Pointe Industries Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Rodney Metals Inc.
TA Mfg. Corp.
Techniques, Inc.
Westlake Plastics, CrystalX Corp.
Wrought Washer Mfg. Co.

SILICATES

Delta Chemical Works, Inc.

SILICON

Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eagle-Picher Co., The
Garrett Corp., The, Air Cruisers Div.
Green Rectifier Co.
United States Dynamics Corp.

SILICONE GREASES

Alpha-Molykote Corp.
Delta Chemical Works, Inc.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.

SILICONE OILS

Delta Chemical Works, Inc.
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.

SILICONE RUBBER

Allied Plastics Supply Corp.
Anchor Packing Co., The
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Chicago-Allis Mfg. Corp.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
Darcoid Co., Inc., The
Delta Chemical Works, Inc.
Eagle-Picher Co., The
Garrett Corp., The, Air Cruisers Div.
General Gasket Inc.
Hewitt-Robins, Inc.
Neosil Products Co.
New England Tape Co., Inc.
Pacific Moulded Products Co.
Raybestos-Manhattan, Inc.
Rogers Corp.
Rubbercraft Corp. of California
Silicone Products Dept., General Electric Co.
Silicones Div.-Union Carbide Corp.
Surprenant Mfg. Co.
Varflex Corp.

SILVER & ALLOYS

Accurate Specialties Co., Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brazing Alloys Co.
American Silver Co.
Anchor Metal Co., Inc.
Attleboro Refining Co. Inc.
Belmont Smelting & Refining Works, Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Dalweld Co. Inc.
Delta Chemical Works, Inc.
Division Lead Co.
Wilbur B. Driver Co.
Eastern Smelting & Refining Corp.
Gibson Electric Co.
Goldsmith Brothers Smelting & Refining Co.
Handy & Harman
Leach & Garner Co., Industrial Div.
P. R. Mallory & Co., Inc.
Standard Metals Corp.
Tricon Mfg. Co.

SILVER PASTE

All-State Welding Alloys Co., Inc.
American Silver Co.
Anchor Metal Co. Inc.
Attleboro Refining Co. Inc.
Belmont Smelting & Refining Works, Inc.
Goldsmith Brothers Smelting & Refining Co.
Handy & Harman
Naz-Dar Co.
Western Gold & Platinum

SLEEVES, METALLIC

Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
American Steel Foundries, Hammond Div.
American Welding & Mfg. Co., The
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Century Fasteners Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Dayton Mfg. Co., Inc.
Dumont Aircraft Fitting Co.
Electronic Techniques, Inc.
Ex-Cell-O Corp.
Fromson Orban Co., Inc.
General Cable Corp.
B. H. Hadley, Inc.
Walter K. Jaros, Aircrafters
Kemp Inc.
La Pointe Industries Inc.
Henry & Miller Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Peerless Products Industries
St. Marys Carbon Co.
Surprenant Mfg. Co.
Thompson Products, Inc.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Weatherhead Co., The

SLEEVES, NON METALLIC

Allied Plastics Supply Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Auburn Mfg. Co., The
Birnbach Radio Co., Inc.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
***COOPER DEVELOPMENT CORP.**
Diamonite Products Mfg. Co.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
Gatke Corp.
Graphite Metallizing Corp.
Walter K. Jaros, Aircrafters
Walter Lee Chemical Corp.
J. E. Menaugh Co.
New England Tape Co., Inc.
Peerles Products Industries
Resistoflex Corp.
Rex Corp., The
Rubbercraft Corp. of California
St. Marys Carbon Co.
Saxonburg Ceramics
Silicone Insulation, Inc.
Surprenant Mfg. Co.
Synthane Corp.
Varflex Corp.
Waterbury Companies, Inc.

SLEEVES, TUBE

Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dumont Aircraft Fitting Co.
Electronic Techniques, Inc.
Enflo Corp.
General Cable Corp.
Henry & Miller Industries, Inc.
Lamtex Industries, Inc.
La Pointe Industries, Inc.
Orange Roller Bearing Co., Inc.
Parker Aircraft Co.
Peerless Products Industries
Resistoflex Corp.
Synthane Corp.
Union Asbestos & Rubber Co.
United Mfg. Co., The
Weatherhead Co., The
Westline Products Div., Western Lithograph Co.
Zippertubing Co., The

SLEEVING

Allied Plastics Supply Corp.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Enflo Corp.
General Cable Corp.
General Plastics Corp. of New Jersey
Lamtex Industries Inc.
Orange Roller Bearing Co., Inc.
Resistoflex Corp.
United Mfg. Co., The
Varflex Corp.
Westline Products Div., Western Lithograph Co.
Zippertubing Co., The

SLIP RING ASSEMBLIES

Antlab Inc.
Dumont Aviation Associates
Electro Tec Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Goodyear Aircraft Corp.
Graphite Metallizing Corp.
Kelsey-Hayes Co.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
***LYCOMING DIV., AVCO MFG. CORP.**
Magnasync Mfg. Co., Ltd.
J. M. Ney Co., The
Servonic Instruments, Inc.
***SLIP RING CO. OF AMERICA**
Uniwave, Inc.

SOLDER, ALUMINUM

Accurate Specialties Co. Inc.
All-State Welding Alloys Co., Inc.
Alpha Metals, Inc.
Aluminum Co. of America
American Solder & Flux Co.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bow Solder Products Co., Inc.
Handy & Harman

SOLDER, INDIUM

Accurate Specialties Co. Inc.
Alpha Metals, Inc.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bow Solder Products Co., Inc.
Bram Metallurgical & Chemical Co.

SOLDER, LEAD—TIN

Accurate Specialties Co. Inc.
All-State Welding Alloys Co., Inc.
Alpha Metals, Inc.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bow Solder Products Co., Inc.
New York Solder Co., Inc.
Tricon Mfg. Co.

SOLDER, PLATINUM

Accurate Specialties Co. Inc.
American Silver Co.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Eastern Smelting & Refining Corp.
Handy & Harman
Metals & Controls Corp.
Tricon Mfg. Co.
Western Gold & Platinum

SOLID ROCKET FUELS

Anderson, Greenwood & Co.
Callery Chemical Co.
***COOPER DEVELOPMENT CORP.**
B. F. Goodrich Aviation Products
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Redstone Arsenal Research Div., Rohm & Haas Co.
Thompson Products, Inc.

SPACERS

Allied Plastics Supply Corp.
Amatom Electronic Hardware Co. Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Amplex Div.-Chrysler Corp.
Auburn Mfg. Co., The
J. H. Bunnell & Co.
California Aircraft Products
Century Fasteners Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
***DIVERSEY ENGRG. CO.**
Dumont Aircraft Fitting Co.
Electronic Techniques, Inc.
Enflo Corp.
Ex-Cell-O Corp.
Freeman Co., The
Garde Mfg. Co.
Gasket, Packing & Specialty Co. Inc.
General Components Inc.
General Gasket Inc.
Walter K. Jaros, Aircrafters
Kelsey-Hayes Co.
Kickhaefer Mfg. Co.
***LAMINATED SHIM CO.**
La Pointe Industries Inc.

J. J. Monaghan Co., Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Pacific Cut Washer Co.
Sealectric Switch & Relay Corp.
Sealol Corp.
Shur-Lok Corp.
Simonds Saw & Steel Co.
Swedlow Plastics Co.
TA Mfg. Corp.
Thompson Products, Inc.
United-Carr Fastener Corp.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
Wrought Washer Mfg. Co.

SPINNINGS, METALLIC

California Aircraft Products
***COOPER DEVELOPMENT CORP.**
Dayton Mfg. Co., Inc.
***DIVERSEY ENGRG. CO.**
Flexonics Corp.
Gasket Mfg. Co. Inc.
Henry & Miller Industries, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kling Metal Spinning & Stamping Co.
***PHOENIX PRODUCTS CO.**
Revere Copper & Brass Inc.
Royal Industries, Inc.
Seamless Products Co., Inc.
Spincraft, Inc.
Superior Spinning & Stamping Co.
Thompson Products, Inc.
***C. W. TORNGREN CO., INC.**
***UNITED AIRCRAFT PRODUCTS, INC.**
Westholt Mfg. Co.
Wright Aeronautical Div.—Curtiss-Wright Corp.

SPRING CONTACT METAL STOCK

American Brass Co., The
American Silver Co.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Gibson Electric Co.
Hamilton Watch Co., Military Products Div.
Leach & Garner Co., Industrial Div.
Mid-West Spring Mfg. Co.
J. M. Ney Co., The
Rodney Metals Inc.
Servicair Co.

SPRINGS

Ace Spring Mfg. Co., Inc.
American Steel Foundries, Hammond Div.
***AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.**
W. L. Barrett Co., The
Crucible Steel Co. of America
Dumont Aircraft Fitting Co.
General Sound Control, Inc.
Hamilton Watch Co., Military Products Div.
Leetronics, Inc.
J. E. Menaugh Co.
Mid-West Spring Mfg. Co.
Newcomb Spring of Conn., Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Reliable Spring & Wire Forms Co., The
Techniques, Inc.

STACKS

ACF Industries, Inc., Advanced Products Div.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Standard Armament Inc.
Winder Aircraft Corp. of Fla.
Wrought Washer Mfg. Co.

STAMPED PARTS, TUBE

Ackerman Gould Co.
Aircraft Mechanics, Inc.
American Brass Co., The
Art Wire & Stamping Co.
Bergen Carbide Co.
California Aircraft Products
Carroll Pressed Metal, Inc.
Cromer Mfg. & Engrg., Inc.
G. M. Dykes Iron Works, Inc.
Elm Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
Henry & Miller Industries, Inc.
Hunter Spring Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kling Metal Spining & Stamping Co.
***LAMINATED SHIM CO.**
Parish Pressed Steel, Div.-Dana Corp.
Penn-Michigan Mfg. Corp.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Stainless Steel Products Inc.
Sylvania Electric Products Inc., Parts Div.
Techniques, Inc.
Wayne Foundry & Stamping Co.
Winder Aircraft Corp. of Fla.
J. H. Winn Inc.

STARTERS, GAS TURBINE ENGINE

Accessory Controls & Equipment Corp.
Bendix Aviation Corp., Red Bank Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
McCormick Selph Associates
Progressive Research & Development Co., Inc.
Propellex Chemical Corp.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Vickers Inc., Div.-Sperry Rand
Wells Industries Corp.

STARTERS, PNEUMATIC

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
McCormick Selph Associates
Sprague Engrg. Corp.
Wells Industries Corp.

STARTERS, ROCKET ENGINE

Atlantic Research Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
***GRAND CENTRAL ROCKET CO.**
McCormick Selph Associates
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Propellex Chemical Corp.
Reaction Motors, Inc.
Solar Aircraft Co.
Turbo Dynamics Corp.

STARTING SYSTEMS & CONTROLS

Accessory Controls & Equipment Corp.
Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
CDC Control Services, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Propellex Chemical Corp.
Telectro Industries Corp.
Vickers Inc., Div.-Sperry Rand

STEEL, ELECTRIC

Armco Steel Corp.
Carpenter Steel Co., The
Crucible Steel Co. of America
Hammett Electric Co.
Republic Steel Corp.
Thompson Products, Inc.
Vanadium-Alloys Steel Co.
***WESTINGHOUSE ELECTRIC CORP.**

STEEL, METAL COATED

American Steel & Wire Div.-United States Steel Corp.
Armco Steel Corp.
Kemp Inc.
Kickhaefer Mfg. Co.
Lukens Steel Co.
National-Standard Co.
Republic Steel Corp.
Arthur Tickle Engrg. Works, Inc.

STEEL, STAINLESS

All Boro Metal Products Co., Inc.
American Silver Co.
American Steel & Wire Div.-United States Steel Corp.
Armco Steel Corp.
J. Bishop & Co. Platinum Works
Carpenter Steel Co., The
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Eastern Stainless Steel Corp.
Electric Steel Foundry Co.
Firth Sterling Inc.
Johnston & Funk Titanium Corp.
Republic Steel Corp.
Rodney Metals Inc.
Joseph T. Ryerson & Son, Inc.
Solar Aircraft Co.
Thompson Products, Inc.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
United States Steel Corp.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America
Wallingford Steel Co.

SWITCHES

***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**

TAILPIPES, JET ENGINE

ACF Industries, Inc., Advanced Products Div.
Aircraft Mechanics, Inc.
American Welding & Mfg. Co., The
Basic Tool Industries, Inc.
Bridgwater Machine Co.
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Finn Aeronautical Div.-T. R. Finn & Co., Inc.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
Penn-Michigan Mfg. Corp.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
***STALKER DEVELOPMENT CO.**
Thompson Products, Inc.
Turbo Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

TANKS

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Aluminum Co. of America
***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Bar-Ray Products, Inc.
Basic Tool Industries, Inc.
California Aircraft Products
Champion Co., The
J. P. DeVine Mfg. Co.
G. M. Dykes Iron Works, Inc.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
Hahn & Clay
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
R. C. Mahon Co., The
Henry & Miller Industries, Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Reaction Motors, Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Royal Industries, Inc.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Shaw Metal Products Corp.
Solar Aircraft Co.
Spincraft, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Wells Industries Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

Auxiliary

ACF Industries, Inc., Advanced Products Div.
Aluminum Co. of America
American Agile Corp.
Basic Tool Industries, Inc.
Champion Co., The
G. M. Dykes Iron Works, Inc.
G. W. Galloway Co.
Joclin Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Henry & Miller Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Rohr Aircraft Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United States Chemical Milling Corp.
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Wells Industries Corp.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Auxiliary Drop

ACF Industries, Inc., Advanced Products Div.
American Agile Corp.
Basic Tool Industries, Inc.
Calcor Corp., Aircraft Div.
Champion Co., The
G. M. Dykes Iron Works, Inc.
G. W. Galloway Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Henry & Miller Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Rohr Aircraft Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Smith-Morris Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United States Chemical Milling Corp.
Weber Aircraft Corp.
Wells Industries Corp.
Westholt Mfg. Co.

Fuel

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Air Logistics Corp.

. . . propulsion system

Air Products, Inc.
Aluminum Co. of America
American Agile Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Buffalo Metal Container Corp.
Champion Co., The
Consolidated American Services, Inc.
G. M. Dykes Iron Works, Inc.
G. W. Galloway Co.
Hupp Aviation Co.
Joclin Mfg. Co.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics D'v.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LAVELLE AIRCRAFT CORP.**
Henry & Miller Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Pressed Steel Tank Co.
Reaction Motors, Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Rohr Aircraft Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
***RYAN INDUSTRIES**
Shaw Metal Products Corp.
Smith-Morris Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
***UNITED AIRCRAFT PRODUCTS, INC.**
United States Chemical Milling Corp.
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Wells Industries Corp.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Liquid Nitrogen

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc.
American Agile Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Aro Equipment Corp., The
Champion Co., The
Consolidated American Services, Inc.
D K Mfg. Co.
G. M. Dykes Iron Works, Inc.
G. W. Galloway Co.
Hahn & Clay
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works, Inc.
Pressed Steel Tank Co.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ronan & Kunzl, Inc.
Ronan & Kunzl Inc., Cryogenic Div.
***RYAN INDUSTRIES**
Solar Aircraft Co.
Superior Air Products Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wells Industries Corp.
Western Arc Welding, Inc.
Weshholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Liquid Oxygen

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc.
American Agile Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Aro Equipment Corp., The
Champion Co., The
Consolidated American Services, Inc.
D K Mfg. Co.
G. M. Dykes Iron Works, Inc.
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hahn & Clay
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
Reaction Motors, Inc.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ronan & Kunzl, Inc.
Ronan & Kunzl Inc., Cryogenic Div.
***RYAN INDUSTRIES**
Solar Aircraft Co.
Spincraft, Inc.
Superior Air Products Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wells Industries Corp.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Wright Aeronautical Div.—Curtiss-Wright Corp.

Liquified Gas Storage

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc.
American Agile Corp.
***AMERCAN MACHINE & FOUNDRY CO.**
Aro Equipment Corp., The
D K Mfg. Co.
G. M. Dykes Iron Works, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hahn & Clay
Herrick L. Johnston, Inc.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Pioneer-Central Div.-Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
Pressed Steel Tank Co.
***RHEEM MFG. CO., AIRCRAFT DIV.**
Ronan & Kunzl, Inc.
Ronan & Kunzl Inc., Cryogenic Div.
***RYAN INDUSTRIES**
Superior Air Products Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Weatherhead Co., The
Wells Industries Corp.
Westholt Mfg. Co.

Oil

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div.-The United Tool & Die Co.
American Agile Corp.
Buffalo Metal Container Corp.
G. M. Dykes Iron Works, Inc.
Hahn & Clay
Houston Fearless Corp.
Hupp Aviation Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
***REGENT JACK MFG. CO., INC.**
Rohr Aircraft Corp.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg. Div.-Warren Brothers Roads Co.
Weber Aircraft Corp.
Wells Industries Corp.
Westholt Mfg. Co.

Self Sealing

ACF Industries, Inc., Advanced Products Div.
American Agile Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Wells Industries Corp.

Transportation and Storage

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div.-The United Tool & Die Co.
Air Logistics Corp.
Air Products, Inc.
Aluminum Co. of America
American Agile Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Applied Design Co.
Buffalo Metal Container Corp.
Butler Mfg. Co.
Calcor Corp. Aircraft Div.
Champion Co., The
G. M. Dykes Iron Works, Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Foreman Mfg. Co.
Hahn & Clay
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Nooter Corp.
Portland Cooper & Tank Works Inc.
Pressed Steel Tank Co.
***REGENT JACK MFG. CO., INC.**
***RHEEM MFG. CO., AIRCRAFT DIV.**
***RYAN INDUSTRIES**
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
***WASHINGTON ALUMINUM CO., INC.**
Weber Aircraft Corp.
Wells Industries Corp.

TANTALUM

Accurate Specialties Co. Inc.
American Agile Corp.
American Silver Co.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Fansteel Metallurgical Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Kennametal Inc.
P. R. Mallory & Co. Inc.
Metals & Controls Corp.
F. H. Paul & Stein Brothers, Inc.

TAPES

Allied Plastics Supply Corp.
American Agile Corp.
Anchor Packing Co., The
Auburn Mfg. Co., The
Chart-Pak Inc.
Duracote Corp.
Dwyer Engrg. Co., Inc.
Gatke Corp.
Green, Tweed & Co.
Raybestos-Manhattan, Inc.
Schlegel Mfg. Co.
Silicones Div.-Union Carbide Corp.

Asbestos

Allied Plastics Supply Corp.
American Agile Corp.
Anchor Packing Co., The
Atlas Asbestos Co.
Auburn Mfg. Co., The
Gatke Corp.
General Cable Corp.
Green, Tweed & Co.
Raybestos-Manhattan, Inc.
Union Asbestos & Rubber Co.

Coated and Impregnated

Allied Plastics Supply Corp.
American Agile Corp.
Arno Adhesive Tapes, Inc.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Coast Mfg. & Supply Co.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Duracote Corp.
General Plastics Corp. of New Jersey
Green, Tweed & Co.
Joclin Mfg. Co.
Johns-Manville Dutch Brand Div.
Narmco Resins & Coatings Co.
Silicones Div.-Union Carbide Corp.
A. T. Stevens Co.
Union Asbestos & Rubber Co.

Electrical Insulation

Allied Plastics Supply Corp.
American Agile Corp.
Anchor Packing Co., The
Atlas Asbestos Co.
Auburn Mfg. Co., The
W. H. Brady Co.
William Brand & Co., Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crane Packing Co.
Dixon Corp.
Enflo Corp.
General Plastics Corp. of New Jersey
Joclin Mfg. Co.
Johns-Manville Dutch Brand D'v.
Mica Fabricating Co.
Okonite Co., The
Raybestos-Manhattan, Inc.
Silicones Div.-Union Carbide Corp.
Surprenant Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**

Fabric

Allied Plastics Supply Corp.
American Agile Corp.
American Cord & Webbing Co., Inc.
Arno Adhesive Tapes, Inc.
Atlas Asbestos Co.
W. H. Brady Co.
William Brand & Co., Inc.
C. R. Daniels, Inc.
Duracote Corp.
Hastings Plastics Inc.
Joclin Mfg. Co.
Johns-Manville Dutch Brand Div.
Schlegel Mfg. Co.
A. T. Stevens Co.

Friction

Allied Plastics Supply Corp.
American Agile Corp.
Anchor Packing Co., The
Continental Rubber Works
Joclin Mfg. Co.
Johns-Manville Dutch Brand Div.
Okonite Co., The

Heat Resistant

Allied Plastics Supply Corp.
American Agile Corp.
American Cord & Webbing Co., Inc.
Arno Adhesive Tapes, Inc.
Auburn Mfg. Co., The
California Aircraft Products
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
General Cable Corp.
General Plastics Corp. of New Jersey
Green, Tweed & Co.
Hastings Plastics Inc.
Joclin Mfg. Co.
Johns-Manville Dutch Brand Div.

Narmco Resins & Coatings Co.
New England Tape Co. Inc.
Silicones Div.-Union Carbide Corp.
Union Asbestos & Rubber Co.

Plastic

Allied Plastics Supply Corp.
American Agile Corp.
Auburn Mfg. Co., The
W. H. Brady Co.
William Brand & Co., Inc.
Chart-Pak, Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Co.
Crane Packing Co.
Dilectrix Corp.
Dixon Corp.
Duracote Corp.
Dwyer Engrg. Co., Inc.
Enflo Corp.
Fluorocarbon Co. Inc., The
General Plastics Corp. of New Jersey
Hastings Plastics Inc.
Joclin Mfg. Co.
Johns-Manville Dutch Brand Div.
Narmco Resins & Coatings Co.
New England Tape Co. Inc.
Okonite Co., The
Raybestos-Manhattan, Inc.
Rex Corp., The
Roovers-Lotson Corp.
Silicones Div.-Union Carbide Corp.
Sohl Co., The
Sparta Mfg. Co.
Surprenant Mfg. Co.
Zippertubing Co., The

Pressure Sensitive

Allied Plastics Supply Corp.
Anchor Packing Co., The
Arno Adhesive Tapes, Inc.
W. H. Brady Co.
William Brand & Co., Inc.
Chart-Pak, Inc.
Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dilectrix Corp.
Duracote Corp.
Enflo Corp.
General Plastics Corp. of New Jersey
Joclin Mfg. Co.
Johns-Manville Dutch Brand Div.
Master Tape Printers
Naz-Dar Co.
Roovers-Lotson Corp.
Servo Corp. of America
Silicones Div.-Union Carbide Corp.
Sohl Co., The
South Shore Nameplate Inc.
Topflight Corp.
Westline Products Div.-Western Lithograph Co.

TEMPERATURE CONTROL SYSTEMS

Acromag Inc.
Aero Research Instrument Co., Inc.
Airborne Accessories Corp.
American Electronics, Inc., Data-Tronics Div.
American Research & Mfg. Corp.
Associated Testing Labs., Inc.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
B & H Instrument Co., Inc.
Barber-Colman Co.
Bar-Ray Products, Inc.
Briggs Associates, Inc.
CDC Control Services, Inc.
Cardinal Instrumentation Corp.
Consolidated Controls Corp.
***COOPER DEVELOPMENT CORP.**
Davenport Mfg. Co.
Devco Engrg. Inc.
Dynamic Controls Corp.
Electronic Control Corp.
Electronic Processes Corp. of California
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
Ellis & Watts Products, Inc.
Fairfield Engineering Corp.
Fenwal Inc.
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Hagan Chemicals & Controls, Inc.
Illinois Testing Laboratories, Inc.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Marquardt Aircraft Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Philadelphia Scientific Glass Co.
Piezo Products Co.
Powers Regulator Co., The
Reeves Instrument Corp.
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Telectro Industries Corp.
Thompson Products, Inc
***UNITED AIRCRAFT PRODUCTS, INC.**
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United States Dynamics Corp.
Vap-Air Div.-Vapor Heating Corp.
Victory Engineering Corp.
Wilcolator Co., The

THERMOCOUPLES

Advanced Electronics, Inc.
Aero Research Instrument Co., Inc.
Airtron, Inc.
B G Corp., The
Barker Sales Co.
J. Bishop & Co. Platinum Works
Conax Corp.
Consolidated Controls Corp.
Electric Auto-Lite Co., The
Electronic Processes Corp. of California
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
Fenwal Inc.
General Electric Co., Apparatus Sales Div.
Gray & Huleguard, Inc.
Harco Labs., Inc.
Illinois Testing Laboratories, Inc.
Leeds & Northrup Co.
Marco Electronics Inc
Minneapolis-Honeywell Regulator Co., Indust. Div.
Phillips Aviation Co.
Precision Tube Co., Inc.
Pyrometer Instrument Co., Inc.
Royco Instruments
T-C Div., Dyna-Empire, Inc.
Wacline, Inc.

THRUST MEASURING INSTRUMENTS

Aero Research Instrument Co. Inc.
Allegany Instrument Co., Inc.
American Electronics, Inc., Data-Tronics Div.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Columbia Research Labs.
Daytronic Corp.
Dynametrics Corp.
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hagan Chemicals & Controls, Inc.
Helland Div.—Minneapolis-Honeywell Regulator Co.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust Div.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Ultradyne, Inc.

THRUST CHAMBERS

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Consolidated Controls Corp.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CO.**
Finn Aeronautical Div., T. R. Finn & Co., Inc.
Hastings Plastics Inc.
Kelsey-Hayes Co.
Parish Pressed Steel, Div.-Dana Corp.
Portland Copper & Tank Works Inc.
Propellex Chemical Corp.
Reaction Motors, Inc.
Ryan Aeronautical Co.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Warren Mfg. Div.-Warren Brothers Roads Co.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

THORIUM

Metals & Controls Corp.
New Process Metals, Inc.
Solar Aircraft Co.
Twix Mfg. Co., Inc.
***WASHINGTON ALUMINUM CO., INC.**

TUBING

Allied Plastics Supply Corp.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., American Metal Hose Div.
Babcock & Wilcox Co. Tubular Products Div.
Beaton & Corbin Mfg. Co., The
California Aircraft Products
Carpenter Steel Co., The
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Empire State Aluminum Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
Haynes Stellite Co., Div.-Union Carbide Corp.
Metal Forming Corp.
Metals & Controls Corp.
Precision Tube Co., Inc.
Raybestos-Manhattan, Inc.
Republic Steel Corp.
Revere Copper & Brass Inc.
Rubbercraft Corp. of California
Ryan Aeronautical Co.
St. Regis Paper Co.
***STAINLESS PROCESSING DIV., WALL COLMONOY CORP.**
Stainless Steel Products, Inc.
Stevens Products, Inc.
D. M. Steward Mfg. Co.
Superior Tube Co.
Synthane Corp.
Tube Reducing Corp.
Uniform Tubes, Inc.
Wallingford Steel Co.
***WASHINGTON ALUMINUM CO., INC.**
***R. D. WERNER CO. INC.**
Woolf Aircraft Products, Inc.
Zippertubing Co., The

Aluminum

All Boro Metal Products Co., Inc.
Aluminum Co. of America
American Brass Co., The
***AMERICAN TUBE BENDING CO., INC.**
Bridgeport Brass Co.
Delta Chemical Works, Inc.
Empire State Aluminum Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Flexaust Co., The
Fromson Orban Co., Inc.
Harvey Aluminum
Kaiser Aluminum & Chemical Sales, Inc.
La Pointe Industries Inc.
National-Standard Co.
Precision Tube Co., Inc.
Revere Copper & Brass Inc.
Roll Formed Products Co.
Joseph T. Ryerson & Son, Inc.
South River Metal Products Co., Inc.
Standard Metals Corp.
Uniform Tubes, Inc.
***WASHINGTON ALUMINUM CO., INC.**
***R. D. WERNER CO. INC.**
Zippertubing Co., The

Asbestos

Allied Plastics Supply Corp.
Atlas Asbestos Co.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Delta Chemical Works, Inc.
Flexaust Co., The
General Plastics Corp. of New Jersey
National-Standard Co.
Paramount Paper Tube Corp.
Raybestos Manhattan, Inc.
Union Asbestos & Rubber Co.
Zippertubing Co., The

Brass or Copper

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., The
***AMERICAN TUBE BENDING CO., INC.**
Ampco Metal, Inc.
Anchor Coupling Co. Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
Delta Chemical Works, Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
National Copper & Smelting Co.
National-Standard Co.
Precision Tube Co., Inc.
Revere Copper & Brass Inc.
Roll Formed Products Co.
Standard Metals Corp.
Uniform Tubes, Inc.

Capillary

Allied Plastics Supply Corp.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., The
J. Bishop & Co. Platinum Works
Bridgeport Brass Co.
Delta Chemical Works, Inc.
Fromson Orban Co., Inc.
National-Standard Co.
Precision Tube Co., Inc.
Service Steel
Superior Tube Co.
Uniform Tubes, Inc.

Ceramic

American Lava Corp.
Atlas Asbestos Co.
Corning Glass Works
Diamonite Products Mfg. Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Erie Resistor Corp.
Flexaust Co., The
Isolantite Mfg. Corp.
Maryland Lava Co.
Mica Fabricating Co.
Morganite, Inc.
Chester Morton Electronics Corp.
National-Standard Co.
Norton Co.
Resdel Corp.
Saxonburg Ceramics
D. M. Steward Mfg. Co.
Thermo Materials, Inc.
Western Gold & Platinum

Fibre

Allied Plastics Supply Corp.
Alpha Wire Corp.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
National-Standard Co.
Paramount Paper Tube Corp.
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Spaulding Fibre Co., Inc.

Finned

Engelhard Industries Inc., D. E. Makepeace Div.
Griscom-Russell Co., The
National-Standard Co.
Revere Copper & Brass Inc.
Veet Industries

Flexible Metal

Allied Plastics Supply Corp.
American Brass Co., The
American Brass Co., American Metal Hose Div.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Beaton & Corbin Mfg. Co., The
Co-Operative Industries, Inc.
D K Mfg. Co.
Delta Chemical Works, Inc.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
General Cable Corp.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
National-Standard Co.
Stainless Steel Products, Inc.
Titeflex, Inc.
Tube Distributors Co., Inc.
Zippertubing Co., The

Fused Quartz

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Hammett Electric Co.
National-Standard Co.
Thermal American Fused Quartz Co., Inc.

Glass Fibre Insulation

Allied Plastics Supply Corp.
Alpha Wire Corp.
American Rocket Co.
American Super Temperature Wires Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Atlas Asbestos Co.
B. & C. Insulation Products, Inc.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Emerson Plastics Corp.
Flexaust Co., The
Franklin Fibre-Lamitex Corp.
General Plastics Corp. of New Jersey
Goodyear Aircraft Corp.
Hastings Plastics Inc.
Hitemp Wires, Inc.
Lamtex Industries, Inc.
National-Standard Co.
Silicone Insulation, Inc.
Stevens Products, Inc.
Synthane Corp.
Union Asbestos & Rubber Co.
Varflex Corp.

Glass, Precision

Buhl Optical Co.
Corning Glass Works
Delta Chemical Works, Inc.
National-Standard Co.
Pacific Universal Products Corp.

Philadelphia Scientific Glass Co.
Solar Aircraft Co.

Metal and Alloy

All Boro Metal Products Co., Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
***AMERICAN TUBE BENDING CO., INC.**
Babcock & Wilcox Co. Tubular Products Div.
Beaton & Corbin Mfg. Co., The
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
California Aircraft Products
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Dow Chemical Co., The
Engelhard Industries Inc., D. E. Makepeace Div.
Haynes Stellite Co., Div.-Union Carbide Corp.
Leach & Garner Co., Industrial Div.
Metal Forming Corp.
National-Standard Co.
Ohio Seamless Tube Div.-Copperweld Steel Co.
Precision Tube Co., Inc.
Revere Copper & Brass Inc.
Ryan Aeronautical Co.
Superior Tube Co.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
Tube Methods Inc.
Tube Reducing Corp.
Veet Industries
Wallingford Steel Co.

Metal Hose, Flexible

Allied Plastics Supply Corp.
American Brass Co., The
American Brass Co., American Metal Hose Div.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Avica Corp.
Beaton & Corbin Mfg. Co., The
Co-Operative Industries, Inc.
D K Mfg. Co.
Federal Metal Hose Corp.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
Hallett Mfg. Co.
National-Standard Co.
Servicair Co.
Stainless Steel Products, Inc.
Titeflex, Inc.

Mica

Allied Plastics Supply Corp.
Bram Metallurgical & Chemical Co.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Delta Chemical Works, Inc.
Magnetic Shield Div.-Perfection Mica Co.
Mica Fabricating Co.
National-Standard Co.

Molybdenum

Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Fansteel Metallurgical Corp.
Micro-Wire Tungsten & Molybdenum Products
National-Standard Co.
Ryan Aeronautical Co.
Service Steel
Tube Distributors Co., Inc.

Monel

***AMERICAN TUBE BENDING CO., INC.**
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Metal Forming Corp.
National-Standard Co.
Precision Tube Co., Inc.
Ryan Aeronautical Co.
Superior Tube Co.
Tube Distributors Co. Inc.
Tube Reducing Corp.
Uniform Tubes, Inc.
Veet Industries

Nickel

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
***AMERICAN TUBE BENDING CO., INC.**
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Metal Forming Corp.
National-Standard Co.
Precision Tube Co., Inc.
Superior Tube Co.
Tube Distributors Co., Inc.
Tube Reducing Corp.
Uniform Tubes, Inc.

Paper

Allied Plastics Supply Corp.
American Rocket Co.
Franklin Fibre-Lamitex Corp.
National-Standard Co.
Paramount Paper Tube Corp.
Rogers Corp.
Synthane Corp.

Phenolic

Allied Plastics Supply Corp.
American Rocket Co.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Crystal-X Corp.
Eljay Corp.
Emerson Plastics Corp.
Franklin Fibre-Lamitex Corp.
Hammett Electric Co.
Hastings Plastics Inc.
Illumitronic Engrg. Co.
Penn Fibre & Specialty Co., Inc.
Resdel Corp.
Rogers Corp.
St. Regis Paper Co.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Synthane Corp.
***WESTINGHOUSE ELECTRIC CORP.**
Westlake Plastics, CrystalX Corp.

Plastic

American Aerophysics Corp.
Joclin Mfg. Co.

Precious Metal

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Anchor Metal Co. Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eastern Smelting & Refining Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Handy & Harman
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
National-Standard Co.
Tricon Mfg. Co.
Uniform Tubes, Inc.

Seamless

All Boro Metal Products Co., Inc.
American Brass Co., The
***AMERICAN TUBE BENDING CO., INC.**
Anchor Coupling Co. Inc.
Babcock & Wilcox Co. Tubular Products Div.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Delta Chemical Works, Inc.
Electric Steel Foundry Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
Metals & Controls Corp.
National-Standard Co.
Ohio Seamless Tube Div.-Copperweld Steel Co.
Precision Tube Co., Inc.
Republic Steel Corp.
Joseph T. Ryerson & Son, Inc.
Service Steel
Superior Tube Co.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
Tube Methods Inc.
Tube Reducing Corp.
Uniform Tubes, Inc.
United States Steel Corp.
Varflex Corp.

Silver

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Bram Metallurgical & Chemical Co.
Cohan Epner Co. Inc.
Delta Chemical Works, Inc.
Eastern Smelting & Refining Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Handy & Harman
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
National-Standard Co.
Solar Aircraft Co.
Standard Metals Corp.
Tricon Mfg. Co.
Uniform Tubes, Inc.

Steel

***AMERICAN TUBE BENDING CO., INC.**
Armco Steel Corp.
Babcock & Wilcox Co. Tubular Products Div.
J. Bishop & Co. Platinum Works
California Aircraft Products
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Electric Steel Foundry Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Fromson Orban Co., Inc.
General Cable Corp.
National-Standard Co.
Ohio Seamless Tube Div.-Copperweld Steel Co.
Precision Tube Co., Inc.
Republic Steel Corp.
Ryan Aeronautical Co.
Joseph T. Ryerson & Son, Inc.
Service Steel
Solar Aircraft Co.
Superior Tube Co.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
Tube Reducing Corp.
Uniform Tubes, Inc.
United States Steel Corp.

Steel, Stainless

All Boro Metal Products Co., Inc.
***AMERICAN TUBE BENDING CO., INC.**
Babcock & Wilcox Co. Tubular Products Div.
Beaton & Corbin Mfg. Co., The
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
California Aircraft Products
Carpenter Steel Co., The
Carpenter Steel Co., The, Alloy Tube Div.
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Electric Steel Foundry Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Flexonics Corp.
Fromson Orban Co., Inc.
Metal Forming Corp.
National-Standard Co.
Precision Tube Co., Inc.
Republic Steel Corp.
Ryan Aeronautical Co.
Joseph T. Ryerson & Son, Inc.
Service Steel
Solar Aircraft Co.
Stainless Steel Products, Inc.
Superior Tube Co.
Timken Roller Bearing Co., The
Tube Distributors Co., Inc.
Tube Methods Inc.
Tube Reducing Corp.
Uniform Tubes, Inc.
United States Steel Corp.
Veet Industries
Wallingford Steel Co.

Tantalum

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Fansteel Metallurgical Corp.
Metals & Controls Corp.
National-Standard Co.
F. H. Paul & Stein Brothers, Inc.
Solar Aircraft Co.

Titanium

Babcock & Wilcox Co. Tubular Products Div.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Carpenter Steel Co., The, Alloy Tube Div.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Flexonics Corp.
Harvey Aluminum
Metals & Controls Corp.
Ryan Aeronautical Co.
Superior Tube Co.
Tube Distributors Co., Inc.
Tube Reducing Corp.
Wallingford Steel Co.

Tungsten

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Fansteel Metallurgical Corp.
Micro-Wire Tungsten & Molybdenum Products

Varnished or Lacquered

Allied Plastics Supply Corp.
Alpha Wire Corp.
B. & C. Insulation Products, Inc.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Paramount Paper Tube Corp.
Varflex Corp.

Varnished Cambric Insulation

Allied Plastics Supply Corp.
Alpha Wire Corp.
B. & C. Insulation Products, Inc.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Varflex Corp.

Woven or Knitted Wire

Alpha Wire Corp.
Cambridge Wire Cloth Co., The
General Cable Corp.
Newark Wire Cloth Co.

TUBULAR FABRICATIONS & ASSEMBLIES

ACF Industries, Inc., Advanced Products Div.

. . . propulsion system

Advanced Electronics, Inc.
Ainslie Corp.
American Brass Co., American Metal Hose Div.
***AMERICAN TUBE BENDING CO., INC.**
American Welding & Mfg. Co., The
Beaton & Corbin Mfg. Co., The
D K Mfg. Co.
Emerson Plastics Corp.
Ludwig Honold Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
La Pointe Industries Inc.
***LAVELLE AIRCRAFT CORP.**
Luria Engrg. Co.
Parish Pressed Steel, Div.-Dana Corp.
Peerless Products Industries
Penn-Michigan Mfg. Corp.
Precision Tube Co., Inc.
Resdel Corp.
Resistoflex Corp.
Titeflex, Inc.
Tube Reducing Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Mfg. Co., The
Universal Machine Co., Inc.
Warren Mfg. Div.-Warren Brothers Roads Co.

TUNGSTEN

Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
Hammett Electric Co.
Solar Aircraft Co.

TURBINE ASSEMBLIES

Air Products, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Bridgwater Machine Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Houston Fearless Corp.
Kelsey-Hayes Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Ryan Aeronautical Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Thompson Products, Inc.
Turbo Products, Inc.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

TURBINE SHAFTS

Air Products, Inc.
Bridgwater Machine Co.
Christie Machine Works
Eaton Mfg. Co., Inc., Fredric Flader Div.
Ex-Cell-O Corp.
Federal Machine Co. Inc.
Guided Missile Div.-De Havilland Aircraft of Canda, Ltd.
Herlo Engrg. Corp.
Houston Fearless Corp.
Kelsey-Hayes Co.
Kemp Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Stratos, Div.-Fairchild Engine & Airplane Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Thompson Products, Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

TURBINE WHEELS

Air Products, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Morris Bean & Co.
Bridgwater Machine Co.
Christie Machine Works
Eaton Mfg. Co., Inc., Fredric Flader Div.
Ex-Cell-O Corp.
Federal Machine Co. Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haynes Stellite Co., Div.-Union Carbide Corp.
Herlo Engrg. Corp.
Houston Fearless Corp.
Kelsey-Hayes Co.
Kennametal Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Merz Engrg., Inc.
Misco Precision Casting Co.
Steel Improvement & Forge Co., The
Stratos, Div.-Fairchild Engine & Airplane Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Thompson Products, Inc.
Turbo Products, Inc.
United Mfg. Co., The
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.
Wyman-Gordon Co.

TURBINES, AIR

Air Products, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Kelsey-Hayes Co.
Marquardt Aircraft Co.
Misco Precision Casting Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Turbo Products, Inc.
Warren Mfg. Div.-Warren Brothers Roads Co.

TURBO FANS

Morris Bean & Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
***GARRETT CORP., THE AIRESEARCH MFG. DIVS.**
Kelsey-Hayes Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

TURBO JET ENGINES

American Welding & Mfg. Co., The
Eaton Mfg. Co., Inc., Fredric Flader Div.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

TURBO PUMPS

Morris Bean & Co.
Marquardt Aircraft Co.
Pesco Products Div.—Borg-Warner Corp.
Reaction Motors, Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Thompson Products, Inc.
Turbo Dynamics Corp.
Wright Aeronautical Div., Curtiss-Wright Corp.

URANIUM

Delta Chemical Works, Inc.
Metals & Controls Corp.

VACUUM PUMPS

ARO Equipment Corp., The
Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
***CORNELIUS CO., THE**
***EASTERN INDUSTRIES, INC.**
Eisler Engrg. Co., Inc.
Green Rectifier Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
Gerard G. Leeds Co., Inc.
Leiman Brothers, Inc.
NRC Equipment Corp.
National Research Corp.
Pesco Products Div.—Borg-Warner Corp.
Schutte & Koerting Co.

VACUUM SYSTEMS & CONTROLS

CDC Control Services, Inc.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
Devco Engrg. Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Green Rectifier Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
Herrick L. Johnston, Inc.
Gerard G. Leeds Co., Inc.
NRC Equipment Corp.
National Research Corp.
Process & Instruments
Research Appliance Co.
***RYAN INDUSTRIES**
Tactair Valve Div.-Aircraft Products Co.
United States Dynamics Corp.
Vacuum Research Co.
Vacuum Tube Products Co. Inc.
Warren Mfg. Div.-Warren Brothers Roads Co.
Weston Hydraulics, Ltd.

VACUUM UNITS

Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
Green Rectifier Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
Herrick L Johnston, Inc.
Gerard G. Leeds Co., Inc.
NRC Equipment Corp.
National Research Corp.
Process & Instruments
Research Appliance Co.
United States Dynamics Corp.
Vacuum Research Co.
Vacuum Tube Products Co. Inc.
Warren Mfg. Div.-Warren Brothers Roads Co.

VALVE GUIDES

Christie Machine Works
Clary Dynamics
Kemp Inc.

VALVE OPERATOR

CDC Control Services, Inc.
Clary Dynamics
Hydra-Power Corp.
Hydromatics, Inc.
Jamesbury Corp.
Philadelphia Gear Works, Inc.
Research Controls
Uniflow Valve Corp.
Vickery Co., The

VALVES

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Alar Products, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Arkwin Industries, Inc.
Associated Valve Co.
Automatic Switch Co.
Auto-Valve Inc.
Carleton Aviation Co., Inc.
Christie Machine Works
Clary Dynamics
Collins Engrg. Corp.
Consolidated Controls Corp.
***CORNELIUS CO., THE**
Dumont Aircraft Fitting Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engelberg Huller Co., Inc.
Futurecraft Corp.
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoof Products Co.
Hydromatics, Inc.
Jamesbury Corp.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Kemp Aero Products, Div.-Kemp Inc.
Ladish Co.
La Pointe Industries Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
Lear, Inc.
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Jas. P. Marsh Corp.
National Airoil Burner Co.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
Research Controls
Rivett Lathe & Grinder Inc.
Robbins Aviation, Inc.
Rocketdyne Div., North American Aviation, Inc.
Milton Roy Co.
Sealol Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Tapered Air Products Corp.
Uniflow Valve Corp.
***VALCOR ENGRG. CORP.**
Vickers Inc., Div.-Sperry Rand
Vickery Co., The
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Acid

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Arkwin Industries, Inc.
Carleton Aviation Co., Inc.
Clary Dynamics
Dumont Aircraft Fitting Co.
Engelberg Huller Co., Inc.
Futurecraft Corp.
G. W. Galloway Co.
General Controls Co.
Hammel-Dahl, Div.-General Controls
Hills-McCanna Co.
Hydromatics, Inc.
James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.

- Lapp Insulator Co., Inc., Radio Specialties Div.
- Lear, Inc.
- Mar Vista Engrg. Co.
- Marotta Valve Corp.
- Pneu-Hydro Valve Corp.
- Progressive Research & Development Co., Inc.
- ***REPUBLIC MFG. CO.**
- Research Controls
- Milton Roy Co.
- Sundstrand Turbo Div., Sundstrand Machine Tool Co.
- Thompson Products, Inc.
- ***VALCOR ENGRG. CORP.**
- Vickery Co., The
- Vinson Mfg. Co. Inc.
- Waldorf Instrument Co., Div.-F. C. Huyck & Sons
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

Acid Resistant

- Accessory Products Co., Div.-Textron Inc.
- Aero Supply Mfg. Co., Inc.
- Airborne Research & Delevopment Corp.
- Arkwin Industries, Inc.
- Associated Valve Co.
- Automatic Switch Co.
- Carleton Aviation Co., Inc.
- Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
- Clary Dynamics
- Dumont Aircraft Fitting Co.
- Engelberg Huller Co., Inc.
- Fischer & Porter Co.
- Futurecraft Corp.
- G. W. Galloway Co.
- General Controls Co.
- Hammel-Dahl, Div.-General Controls
- Hills-McCanna Co.
- Hoke Inc.
- Hydromatics, Inc.
- James, Pond & Clark, Inc.
- Jamesbury Corp.
- Kemp Aero Products, Div.-Kemp Inc.
- Kohler Co.
- Ladish Co.
- La Pointe Industries Inc.
- Lapp Insulator Co., Inc., Radio Specialties Div.
- Marotta Valve Corp.
- Minneapolis-Honeywell Regulator Co., Indust. Div.
- Parker Aircraft Co.
- Pneu-Hydro Valve Corp.
- Progressive Research & Development Co., Inc.
- ***REPUBLIC MFG. CO.**
- Research Controls
- Milton Roy Co.
- Saylor Electric Products Corp.
- Sealol Corp.
- Tapered Air Products Corp.
- Thompson Products, Inc.
- Uniflow Valve Corp.
- ***UNITED AIRCRAFT PRODUCTS, INC.**
- ***VALCOR ENGRG. CORP.**
- Vickery Co., The
- Vinson Mfg. Co. Inc.
- Waldorf Instrument Co., Div.-F. C. Huyck & Sons
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

Afterburner

- Aero Supply Mfg. Co., Inc.
- Allen Aircraft Products, Inc.
- American Power Jet Co.
- Arkwin Industries, Inc.
- CDC Control Services, Inc.
- Carleton Aviation Co., Inc.
- Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
- Clary Dynamics
- Consolidated Controls Corp.
- Dumont Aircraft Fitting Corp.
- Ex-Cell-O Corp.
- General Controls Co.
- Hammel-Dahl, Div.-General Controls
- Walter J. Hyatt Co., The
- Hydromatics, Inc.
- Kemp Aero Products, Div.-Kemp Inc.
- Kohler Co.
- Mar Vista Engrg. Co.
- Mercury Rad Corp.
- Parker Aircraft Co.
- Pneu-Hydro Valve Corp.
- A. U. Stone & Co., Inc.
- Thompson Products, Inc.
- ***UNITED AIRCRAFT PRODUCTS, INC.**
- ***VACOR ENGRG. CORP.**
- Waldorf Instrument Co., Div.-F. C. Huyck & Sons
- Weston Hydraulics, Ltd.
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

Air

- Accessory Products Co., Div.-Textron Inc.
- Aero Supply Mfg. Co., Inc.
- Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
- Airborne Research & Development Corp.
- Alco Valve Co.
- Allen Aircraft Products, Inc.
- Altair Inc.
- Arkwin Industries, Inc.
- Aro Equipment Corp., The
- Automatic Switch Co.
- Barber-Colman Co.
- Barksdale Valves
- Bridgeport Brass Co.
- A. W. Cash Co.
- Clary Dynamics
- Consolidated Controls Corp.
- ***CORNELIUS CO., THE**
- Dumont Aircraft Fitting Co.
- ***ELECTROL INC.**
- Engfelberg Huller Co., Inc.
- Fischer & Porter Co.
- Futurecraft Corp.
- ***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
- General Controls Co.
- Hammel-Dahl, Div.-General Controls
- Hoke Inc.
- Walter J. Hyatt Co., The
- Imperial Brass Mfg. Co., The
- Jamesbury Corp.
- ***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
- Kemp Aero Products, Div-Kemp Inc.
- Walter Kidde & Co., Inc., Aviation Div.
- ***KOONTZ-WAGNER ELECTRIC CO., INC.**
- La Pointe Industries Inc.
- Lear, Inc.
- ***WALLACE O. LEONARD, INC.**
- Lyndon Aircraft, Inc.
- M. C. Mfg. Co.
- Marotta Valve Corp.
- Mechanical Air Controls, Inc.
- Mercury Rad Corp.
- Minneapolis-Honeywell Regulator Co., Indust. Div.
- J. J. Monaghan Co., Inc.
- National Airoil Burner Co.
- Parker Aircraft Co.
- Pneu-Hydro Valve Corp.
- Progressive Research & Development Co., Inc.
- ***REPUBLIC MFG. CO.**
- Research Controls
- Rivett Lathe & Grinder Inc.
- Robbins Aviation, Inc.
- Sealol Corp.
- A. U. Stone & Co., Inc.
- Stratos, Div.-Fairchild Engine & Airplane Corp.
- Tactair Valve Div.-Aircraft Products Co.
- Talley Corp., The
- Universal Dynamics Corp.
- ***VALCOR ENGRG. CORP.**
- Vap-Air Div., Vapor Heating Corp.
- Vickery Co., The
- Vinson Mfg. Co. Inc.
- Waldorf Instrument Co., Div.-F. C. Huyck & Sons
- Weston Hydraulics, Ltd.
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

Anti-Gravity

- Accessory Products Co., Div.-Textron Inc.
- Aero Supply Mfg. Co., Inc.
- Aerotec Corp., The
- Airborne Research & Development Corp.
- Alar Products, Inc.
- Arkwin Industries, Inc.
- ARO Equipment Corp., The
- Clary Dynamics
- ***CORNELIUS CO., THE**
- General Controls Co.
- Hammel-Dahl, Div.-General Controls
- ***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
- Walter J. Hyatt Co., The
- Parker Aircraft Co.
- Pneu-Hydro Valve Corp.
- Vinson Mfg. Co. Inc.
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

Automatic Shutoff—Hydraulic

- Aero Supply Mfg. Co., Inc.
- Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
- Altair Inc.
- Annin Corp., The
- Arkwin Industries, Inc.
- Automatic Switch Co.
- Bendix Products Div., Bendix Aviation Corp.
- CDC Control Services, Inc.
- Carleton Aviation Co., Inc.
- A. W. Cash Co.
- Clary Dynamics
- Dumont Aircraft Fitting Co.
- Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
- Fischer & Porter Co.
- Futurecraft Corp.
- ***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
- ***GREER HYDRAULICS, INC.**
- B. H. Hadley, Inc.
- Hammel-Dahl, Div.-General Controls
- Walter J. Hyatt Co., The
- Hydra-Power Corp.
- Hydromatics, Inc.
- Jamesbury Corp.
- Kemp Aero Products, Div.-Kemp Inc.
- Kohler Co.
- ***KOONTZ-WAGNER ELECTRIC CO., INC.**
- La Pointe Industries Inc.
- ***WALLACE O. LEONARD, INC.**
- Marotta Valve Corp.
- Mercury Rad Corp.
- Ozone Metal Products Corp.
- Parker Aircraft Co.
- Pneu-Hydro Valve Corp.
- Progressive Research & Development Co., Inc.
- ***REPUBLIC MFG. CO.**
- A. U. Stone & Co., Inc.
- Tactair Valve Div.-Aircraft Products Co.
- Thompson Products, Inc.
- ***UNITED AIRCRAFT PRODUCTS, INC.**
- ***VALCOR ENGRG. CORP.**
- Vickers Inc., Div.-Sperry Rand
- Vinson Mfg. Co. Inc.
- Waldorf Instrument Co., Div.-F. C. Huyck & Sons
- Weston Hydraulics, Ltd.
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

Autopilot Control

- Arkwin Industries, Inc.
- CDC Control Services, Inc.
- Cadillac Gage Co.
- Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
- ***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
- Hammel-Dahl, Div.-General Controls
- Kemp Aero Products, Div.-Kemp Inc.
- La Pointe Industries Inc.
- Lear, Inc.
- Pacific Div.-Bendix Aviation Corp.
- Parker Aircraft Co.
- ***REPUBLIC MFG. CO.**
- Research Controls
- Tactair Valve Div.-Aircraft Products Co.
- ***VALCOR ENGRG. CORP.**
- Weston Hydraulics, Ltd.
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

Bleeder

- Aero Supply Mfg. Co., Inc.
- Airborne Research & Development Corp.
- Arkwin Industries, Inc.
- Associated Valve Co.
- Automatic Switch Co.
- Auto-Valve Inc.
- CDC Control Services, Inc.
- Clary Dynamics
- Dumont Aircraft Fitting Co.
- ***ELECTROL INC.**
- ***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
- ***GREER HYDRAULICS, INC.**
- Hammel-Dahl, Div.-General Controls
- Herlo Engrg. Corp.
- Hydra-Power Corp.
- Hydromatics, Inc.
- James, Pond & Clark, Inc.
- Kemp Aero Products, Div.-Kemp Inc.
- Kohler Co.
- La Pointe Industries Inc.
- Gerard G. Leeds Co., Inc.
- Mercury Rad Corp.
- Parker Aircraft Co.
- Pneu-Hydro Valve Corp.
- ***REPUBLIC MFG. CO.**
- Schutte & Koerting Co.
- Tactair Valve Div.-Aircraft Products Co.
- ***UNITED AIRCRAFT PRODUCTS, INC.**
- United Supply Co.
- ***VALCOR ENGRG. CORP.**
- Vickers Inc., Div.-Sperry Rand
- Vinson Mfg. Co. Inc.
- Waldorf Instrument Co., Div.-F. C. Huyck & Sons
- Weatherhead Co., The
- Whittaker Controls, Div.-Telecomputing Corp.
- Whittaker Gyro, Div.-Telecomputing Corp.

By-Pass

- Accessory Products Co., Div.-Textron Inc.
- Aero Supply Mfg. Co., Inc.
- Airborne Research & Development Corp.
- American Tool Co.
- Arkwin Industries, Inc.
- Associated Valve Co.
- Automatic Switch Co.
- Barber-Colman Co.
- CDC Control Services, Inc.
- Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
- Clary Dynamics
- Consolidated Controls Corp.
- ***CORNELIUS CO., THE**
- Dumont Aircraft Fitting Co.
- ***ELECTROL INC.**
- Engelberg Huller Co., Inc.
- Ex-Cell-O Corp.
- ***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
- ***GREER HYDRAULICS, INC.**
- Hammel-Dahl, Div.-General Controls
- Hydra-Power Corp.
- Hydromatics, Inc.
- James, Pond & Clark, Inc.
- ***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
- Kemp Aero Products, Div.-Kemp Inc.
- La Pointe Industries Inc.
- M. C. Mfg. Co.

Marotta Valve Corp.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
***REPUBLIC MFG. CO.**
Research Controls
Milton Roy Co.
Schutte & Koerting Co.
Tactair Valve Div.-Aircraft Products Co.
Tapered Air Products Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Supply Co.
***VALCOR ENGRG. CORP.**
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Check and Check Relief

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aerotec Corp., The
Airborne Research & Development Corp.
All American Aircraft Products, Inc.
Allen Aircraft Products, Inc.
American Power Jet Co.
Anderson, Greenwood & Co.
Annin Corp., The
Arkwin Industries, Inc.
Aro Equipment Corp., The
Associated Valve Co.
Auto-Valve Inc.
Barber-Colman Co.
Barksdale Valves
Carleton Aviation Co., Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Collins Engrg. Corp.
***CORNELIUS CO., THE**
Dumont Aircraft Fitting Co.
Electric Steel Foundry Co.
***ELECTROL INC.**
Engelberg Huller Co., Inc.
Engineered Products Co., The
Essex Mfg. Co., Inc.
Futurecraft Corp.
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***GREER HYDRAULICS, INC.**
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Herlo Engrg. Corp.
Hoefner Corp.
Hoke Inc.
Hoof Products Co.
Walter J. Hyatt Co., The
Hydra-Power Corp.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Kohler Co.
Ladish Co.
La Pointe Industries Inc.
***WALLACE O. LEONARD, INC.**
Marotta Valve Corp.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Reaction Motors, Inc.
***REPUBLIC MFG. CO.**
Research Appliance Co.
A. U. Stone & Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Tapered Air Products Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**
***VALCOR ENGRG. CORP.**
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weatherhead Co., The
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Check—Hydraulic, Gas

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
All American Aircraft Products Inc.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Associated Valve Co.
Carleton Aviation Co., Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
***CORNELIUS CO., THE**
Dumont Aircraft Fitting Co.
***ELECTROL INC.**
Essex Mfg. Co., Inc.
Futurecraft Corp.
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
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B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Herlo Engrg. Corp.
Walter J. Hyatt Co., The
Hydra-Power Corp.
James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
La Pointe Industries Inc.
***WALLACE O. LEONARD, INC.**
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Parker-Hannifin Corp.
Pneu-Hydro Valve Corp.
Reaction Motors, Inc.
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Sundstrand Turbo Div., Sundstrand Machine Tool Co.
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Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Control

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Alco Valve Co.
Altair Inc.
Arkwin Industries, Inc.
Associated Valve Co.
Automatic Switch Co.
Barber-Colman Co.
Barksdale Valves
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
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Progressive Research & Development Co., Inc.
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Robbins Aviation, Inc.
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Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Tactair Valve Div.-Aircraft Products Co.
Uniflow Valve Corp.
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Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Diaphragm

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Alco Valve Co.
Arkwin Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Chicago-Allis Mfg. Corp.
Clary Dynamics
Consolidated Controls Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
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Enflo Corp.
Gasket Mfg. Co. Inc.
General Controls Co.
Gray & Huleguard, Inc.
Hammel-Dahl, Div.-General Controls
High Vacuum Equipment Corp.
Hills-McCanna Co.
Imperial Brass Mfg. Co., The
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
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Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
J. J. Monaghan Co., Inc.
Parker Aircraft Co.
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Powers Regulator Co., The
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Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Dump

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Allen Aircraft Products, Inc.
Arkwin Industries Inc.
Automatic Switch Co.
Auto-Valve Inc.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
Clary Dynamics
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***ELECTROL INC.**
Engelberg Huller Co., Inc.
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General Controls Co.
Hammel-Dahl, Div.-General Controls
Herlo Engrg. Corp.
Hydra-Power Corp.
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Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
La Pointe Industries Inc.
***WALLACE O. LEONARD, INC.**
Marotta Valve Corp.
Mercury Rad Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
***REPUBLIC MFG. CO.**
Tapered Air Products Corp.
***VALCOR ENGRG. CORP.**
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Electronic Solenoid

Advanced Electronics, Inc.
Aero Supply Mfg. Co., Inc.
Alco Valve Co.
Altair Inc.
Arkwin Industries, Inc.
Automatic Switch Co.
Barksdale Valves
Cadillac Gage Co.
Clary Dynamics
Dynamic Controls Corp.
***EASTERN INDUSTRIES, INC.**
***ELECTROL INC.**
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Engelberg Huller Co., Inc.
Futurecraft Corp.
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Kemp Aero Products, Div.-Kemp Inc.

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Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Skinner Electric Valve Div., The Skinner Chuck Co.
Tactair Valve Div.-Aircraft Products Co.
Talley Corp., The
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Engine Inlet

Aero Supply Mfg. Co., Inc.
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CDC Control Services, Inc.
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Hammel-Dahl, Div.-General Controls
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Marquardt Aircraft Co.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Thompson Products, Inc.
Vinson Mfg. Co. Inc.
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Whittaker Gyro, Div.-Telecomputing Corp.

Exhaust

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CDC Control Services, Inc.
Christie Machine Works
Clary Dynamics
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Hydromatics, Inc.
Kemp Aero Products, Div.-Kemp Inc.
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Mercury Rad Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Ryan Aeronautical Co.
Thompson Products, Inc.
United Supply Co.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Float

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Allen Aircraft Products, Inc.
Arkwin Industries, Inc.
Associated Valve Co.
Clary Dynamics
Hammel-Dahl, Div.-General Controls
Kemp Aero Products, Div.-Kemp Inc.
La Pointe Industries Inc.
Pneu-Hydro Valve Corp.
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Vinson Mfg. Co. Inc.
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Globe

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Annin Corp., The
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Automatic Switch Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Dumont Aircraft Fitting Co
Electric Steel Foundry Co.
General Nuclear Corp.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Kemp Aero Products, Div.-Kemp Inc.
Ladish Co.
National Airoil Burner Co.
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Thompson Products, Inc.
Uniflow Valve Corp.
Vacuum Research Co.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Helium

Accessory Products Co., Div.-Textron Inc.
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Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
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Carleton Aviation Co., Inc.
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Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
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Futurecraft Corp.
General Controls Co.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Walter J. Hyatt Co., The
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Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
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Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Penu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
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Stratos, Div.-Fairchild Engine & Airplane Corp.
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Uniflow Valve Corp.
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Whittaker Gyro, Div.-Telecomputing Corp.

High Pressure Gas

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Anderson, Greenwood & Co.
Annin Corp., The
Arkwin Industries, Inc.
Aro Equipment Corp., The
Associated Valve Co.
Automatic Switch Co.
Barksdale Valves
Carleton Aviation Co., Inc.
A. W. Cash Co.
Clary Dynamics
Dumont Aircraft Fitting Co.
Dynamic Controls Corp.
Engelberg Huller Co., Inc.
Futurecraft Corp.
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*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Hydra-Power Corp.
Hydromatics, Inc.
James, Pond & Clark, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
*KOONTZ-WAGNER ELECTRIC CO., INC.
La Pointe Industries Inc.
*WALLACE O. LEONARD, INC.
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
Sealol Corp.
A. U. Stone & Co., Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Tactair Valve Div.-Aircraft Products Co.
Tapered Air Products Corp.
Thompson Products, Inc.
Uniflow Valve Corp.
*VALCOR ENGRG. CORP.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Western Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Hydraulic System

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alco Valve Co.
Altair Inc.
American Brake Shoe Co.
*AMERICAN MACHINE & FOUNDRY CO.
American Tool Co.
Arkwin Industries, Inc.
Associated Valve Co.
Automatic Switch Co.
Auto-Valve Inc.
Bridgwater Machine Co.
Cadillac Gage Co.
Carleton Aviation Co., Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
*COMMERCIAL SHEARING & STAMPING CO.
*CORNELIUS CO., THE
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Dumont Aircraft Fitting Co.
Dynamic Controls Corp.
*EASTERN INDUSTRIES, INC.
Eddington Metal Specialty Co.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoof Products Co.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
James, Pond & Clark, Inc.
Kearfott Co., Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
*KOONTZ-WAGNER ELECTRIC CO., INC.
La Pointe Industries Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
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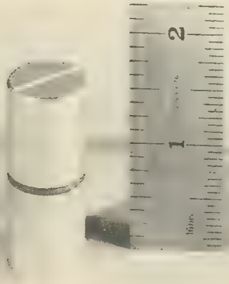

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Parker Aircraft Co.
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Progressive Research & Development Co., Inc.
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Robbins Aviation, Inc.
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Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weatherhead Co., The
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Hydrogen

Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Associated Valve Co.
Automatic Switch Co.
Carleton Aviation Co., Inc.
Clary Dynamics
Futurecraft Corp.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Walter J. Hyatt Co., The
Hydromatics, Inc.
James, Pond & Clark, Inc.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
***WALLACE O. LEONARD, INC.**
Mar Vista Engrg. Co.
Marotta Valve Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
***REPUBLIC MFG. CO.**
Research Controls
Robbins Aviation, Inc.
A. U. Stone & Co., Inc.
Talley Corp., The
Thompson Products, Inc.
Uniflow Valve Corp.
Vinson Mfg. Co. Inc.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Motor Operated

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Barber-Colman Co.
CDC Control Services, Inc.
Clary Dynamics
Consolidated Controls Corp.
Dumont Aircraft Fitting Co.
Futurecraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Controls Co.
General Nuclear Corp.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hammett Electric Co.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
Jamesbury Corp.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
La Pointe Industries Inc.
Lyndon Aircraft, Inc.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Motordyne Inc.
Oil-Dyne, Inc.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Philadelphia Gear Works, Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
***REPUBLIC MFG. CO.**
Research Controls
Robbins Aviation, Inc.
Talley Corp., The
Task Corp.
Thompson Products, Inc.
Uniflow Valve Corp.
Vap-Air Div., Vapor Heating Corp.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Needle

Accessory Products Co., Div.-Textron Inc.
Arkwin Industries, Inc.
Associated Valve Co.
Auto-Valce Inc.
Clary Dynamics
Dumont Aircraft Fitting Co.
Electric Steel Foundry Co.
Engineered Products Co., The
Futurecraft Corp.
***GREER HYDRAULICS, INC.**
Hammel-Dahl, Div.-General Controls
Herlo Engrg. Corp.
Hoke Inc.
Hydra-Power Corp.
Idea-Aerosmith Inc.
Imperial Brass Mfg. Co., The
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
Ladish Co.
La Pointe Industries, Inc.
Gerard G. Leeds Co., Inc.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
National Airoil Burner Co.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
***REPUBLIC MFG. CO.**
Research Controls
Robbins Aviation, Inc.
Scientific Instrument Co.
Tapered Air Products Corp.
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
United Supply Co.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Plug

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Allen Aircraft Products, Inc.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Auto-Valve Inc.
Clary Dynamics
General Controls Co.
General Nuclear Corp.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
Imperial Brass Mfg. Co., The
James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
Ladish Co.
La Pointe Industries Inc.
Marotta Valve Corp.
Mercury Rad Corp.
National Airoil Burner Co.
Pneu-Hydro Valve Corp.
***REPUBLIC MFG. CO.**
Vickery Co., The
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Pneumatic

Accessory Controls & Equipment Corp.
Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Altair Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Anderson, Greenwood & Co.
Annin Corp., The
Arkwin Industries Inc.
Aro Equipment Corp., The
Automatic Switch Co.
Auto-Valve Inc.
Barber-Colman Co.
Cadillac Gage Co.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Chandler-Evans, Div.—Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
***CORNELIUS CO., THE**
Dynamic Controls Corp.
Engelberg Huller Co., Inc.
Fischer & Porter Co.
Futurecraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS**
General Controls Co.
***GREER HYDRAULICS, INC.**
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
B. H. Hadley, Inc.
Hammel-Dahl, Div.—General Controls
Herlo Engrg. Corp.
Hoefner Corp.
Hoof Products Co.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
James, Pond & Clark, Inc.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Kohler Co.
***KOONTZ-WAGNER ELECTRIC CO., INC.**
La Pointe Industries Inc.
Lear, Inc.
***WALLACE O. LEONARD, INC.**
Lyndon Aircraft, Inc.
M. C. Mfg. Co.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Marquardt Aircraft Co.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Powers Regulator Co., The
Progressive Research & Development Co., Inc.
***REPUBLIC MFG. CO.**
Research Controls
Robbins Aviation, Inc.
Ryan Aeronautical Co.
Scientific Instrument Co.
A. U. Stone & Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Talley Corp., The
Thompson Products, Inc.
Uniflow Valve Corp.
United Control Corp.
Vacuum Research Co.
***VALCOR ENGRG. CORP.**
Vap-Air Div., Vapor Heating Corp.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Power Control

Aero Supply Mfg. Co., Inc.
Annin Corp., The
Arkwin Industries, Inc.
CDC Control Services, Inc.
Clary Dynamics
Consolidated Controls Corp.
Dumont Aircraft Fitting Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Nuclear Corp.
***GREER HYDRAULICS, INC.**
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoefner Corp.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Kemp Aero Products, Div.-Kemp Inc.
***KOONTZ-WAGNER ELECTRIC CO., INC.**
Marquardt Aircraft Co.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Robot Appliances Inc.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
***VALCOR ENGRG. CORP.**
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Pressure Regulating

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Aerotec Corp., The
Airborne Research & Development Corp.
Alar Products, Inc.
Alco Valve Co.
Allen Aircraft Products, Inc.
Altair Inc.
American Power Jet Co.
Annin Corp., The
Arkwin Industries, Inc
Aro Equipment Corp., The
Associated Valve Co.
Bendix Products Div., Bendix Aviation Corp.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
***CORNELIUS CO., THE**
Devilbiss Co., The

Dumont Aircraft Fitting Co.
*EASTERN INDUSTRIES, INC.
*ELECTROL INC.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fischer & Porter Co.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Nuclear Corp.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoke, Inc.
Walter J. Hyatt Co., The
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Kohler Co.
La Pointe Industries Inc.
*WALLACE O. LEONARD, INC.
M. C. Mfg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Philco Corp., Government & Industrial Divs.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Powers Regulator Co., The
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Rivett Lathe & Grinder Inc.
Schutte & Koerting Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Thompson Products, Inc.
Uniflow Valve Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Relief and By-Pass

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Allen Aircraft Products, Inc.
American Power Jet Co.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Aro Equipment Corp., The
Associated Valve Co.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
*CORNELIUS CO., THE
Dumont Aircraft Fitting Co.
*EASTERN INDUSTRIES, INC.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Engineered Products Co., The
Ex-Cell-O Corp.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Nuclear Corp.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Herlo Engrg. Corp.
Hoefner Corp.
Walter J. Hyatt Co., The
Hydra-Power Corp.
James, Pond & Clark, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Kohler Co.
La Pointe Industries Inc.
*WALLACE O. LEONARD, INC.
M. C. Mfg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Research Controls
Rivett Lathe & Grinder Inc.
Milton Roy Co.
Schutte & Koerting Co.
A. U. Stone & Co., Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Restrictor

Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
Aro Equipment Corp, The
CDC Control Services, Inc.
Clary Dynamics
*CORNELIUS CO., THE
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
*ELECTROL INC.
Futurecraft Corp.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
Marotta Valve Corp.
Mercury Rad Corp.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
A. U. Stone & Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*VALCOR ENGRG. CORP.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Rocket Fuel

Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Annin Corp., The
Arkwin Industries, Inc.
Associated Valve Co.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
Clary Dynamics
Dean & Benson Research Inc.
Dumont Aircraft Fitting Co.
Futurecraft Corp.
General Controls Co.
Gray & Huleguard, Inc.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Herlo Engrg. Corp.
Hoefner Co.
Walter J. Hyatt Co., The
Hydromatics, Inc.
James, Pond & Clark, Inc.
Jamesbury Corp.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
Lear, Inc.
*WALLACE O. LEONARD, INC.
Marotta Valve Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
South Wind Div., Stewart Warner Corp.
A. U. Stone & Co., Inc.
Thompson Products, Inc.
Uniflow Valve Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Rotary

Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
General Nuclear Corp.
*GREER HYDRAULICS, INC.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Lyndon Aircraft, Inc.
Mercury Rad Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pierce Governor Co. Inc., The
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Thompson Products, Inc.
Vap-Air Div., Vapor Heating Corp.
Vickers Inc. Div.-Sperry Rand
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Sequence

Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
Clary Dynamics
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Futurecraft Corp.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mechanical Air Controls, Inc.
Mercury Rad Corp.
Pacific Div.-Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
*REPUBLIC MFG. CO.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Servo

Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Alco Valve Co.
Arkwin Industries, Inc.
CDC Control Services, Inc.
Cadillac Gage Co.
Clary Dynamics
Consolidated Controls Corp.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
*EASTERN INDUSTRIES, INC.
Eddington Metal Secialty Co.
*ELECTROL INC.
Ex-Cell-O Corp.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
Hagan Chemicals & Controls, Inc.
Hammel-Dahl, Div.-General Controls
Hammett Electric Co.
Hoefner Corp.
Hydra-Power Corp.
Ideal-Aerosmith, Inc.
Kearfott Co., Inc.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
*KOONTZ-WAGNER ELECTRIC CO., INC.
La Pointe Industries Inc.
Mar Vista Engrg. Co.
Mercury Rad Corp.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pesco Products Div.-Borg-Warner Corp.
Philco Corp., Government & Industrial Divs.
Pneu-Hydro Valve Corp.
Reaction Motors, Inc.
Royal Industries, Inc.
Thompson Products, Inc.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weighing & Control Components, Inc.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Shuttle Solenoid

Aero Supply Mfg. Co., Inc.
Alco Valve Co.
Arkwin Industries, Inc.
Clary Dynamics
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engelberg Huller Co., Inc.
Futurecraft Corp.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
*KOONTZ-WAGNER ELECTRIC CO., INC.
La Pointe Industries Inc.
Lyndon Aircraft, Inc.
M. C. Mfg. Co.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mechanical Air Controls, Inc.
Mercury Rad Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vinson Mfg. Co. Inc.

Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Strainer

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
Auto Valve Inc.
Clary Dynamics
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
Hammel-Dahl, Div.-General Controls
Ladish Co.
Newark Wire Cloth Co.
Pneu-Hydro Valve Corp.
*REPUBLIC MFG. CO.
A. U. Stone & Co., Inc.
Thompson Products, Inc.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Suction Regulating

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
Aro Equipment Corp., The
Associated Valve Co.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
B. H. Hadley, Inc.
Hammel-Dahl Div.-General Controls
Kemp Aero Products, Div.-Kemp Inc.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Robbins Aviation, Inc.
Thompson Products, Inc.
Uniflow Valve Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Surge

Accessory Products Co., Div.-Textron Inc.
Aero Supply Mfg. Co., Inc.
Allen Aircraft Products Inc
American Brake Shoe Co., Kellogg Div.
Arkwin Industries, Inc.
Associated Valve Co.
CDC Control Services, Inc.
Clary Dynamics
Consolidated Controls Corp.
*ELECTROL INC.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammel-Dahl, Div.—General Controls
Hydra-Power Corp.
Kemp Aero Products, Div.-Kemp Inc.
Marotta Valve Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Thermostatic

Alco Valve Co.
Arkwin Industries, Inc.
Barber-Colman Co.
Consolidated Controls Corp.
Dynamic Controls Corp.
*EASTERN INDUSTRIES, INC.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammel-Dahl, Div.-General Controls
Hydromatics, Inc.
Pneu-Hydro Valve Corp.
Powers Regulator Co., The
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vap-Air Div., Vapor Heating Corp.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Throttling

Annin Corp., The
Arkwin Industries, Inc.
Associated Valve Co.
Barber-Colman Co.
CDC Control Services, Inc.
A. W. Cash Co.
Clary Dynamics
*GREER HYDRAULICS, INC.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Hydra-Power Corp.
Kemp Aero Products, Div.-Kemp Inc.
Ladish Co.
Marotta Valve Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Tapered Air Products Corp.
Thompson Products, Inc.
Uniflow Valve Corp.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
Veeco Vacuum Corp.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Transfer

Aero Supply Mfg. Co., Inc.
Automatic Switch Co.
Clary Dynamics
*ELECTROL INC.
Futurecraft Corp.
*GREER HYDRAULICS, INC.
Hammel Dahl, Div.-General Controls
Hydra-Power Corp.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
M. C. Mfg. Co.
Mercury Rad Corp.
Pacific Div.-Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Tapered Air Products Corp.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

VAPORIZERS, LIQUID OXYGEN

Air Products, Inc.
Airborne Research & Development Corp.
Carleton Aviation Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
B. H. Hadley, Inc.
Herrick L. Johnston, Inc.
Pioneer-Central Div., Bendix Aviation Corp.
*RYAN INDUSTRIES
Stearns-Roger Mfg. Co.
Superior Air Products Co.

VENTURI TUBES

Aero Research Instrument Co. Inc.
Beaton & Corbin Mfg. Co., The
*COOPER DEVELOPMENT CORP.
*DIVERSEY ENGRG. CO.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
National Airoil Burner Co.
*PHOENIX PRODUCTS CO.
Pressed Steel Tank Co.
Superior Spinning & Stamping Co.
United Mfg. Co., The

VIBRATION ABSORBERS

American Brass Co., American Metal Hose Div.
Applied Design Co.
Columbia Research Labs
Joe Davidson & Associates
Dow-Elco, Inc.
Federal Shock Mount Div.-The Korfund Co.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
General Cable Corp.
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Hydra-Power Corp.
Walter Kidde & Co., Inc., Aviation Div.
MB Mfg. Co.
Robinson Aviation, Inc.
A. T. Stevens Co.
Titeflex, Inc.
United Mfg. Co., The

WASHERS

Accurate Specialties Co. Inc.
Acme Mfg. & Gasket Co.
Allied Plastics Supply Corp.
Allmetal Screw Products Co., Inc.
Aluminum Co. of America
American Brass Co., The
Anchor Metal Co., Inc.
Auburn Mfg. Co., The
Century Fasteners Corp.
Chase Brass & Copper Co., Inc.
Chicago-Allis Mfg. Corp.
Circon Component Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Danly Machine Specialties, Inc.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Emerson Plastics Corp.
Enflo Corp.
Excelsior Leather Washer Mfg. Co. Inc.
Gasket Mfg. Co. Inc.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
General Cement Mfg. Co., Div.-Textron, Inc.
General Components Inc.
General Gasket Inc.
Green, Tweed & Co.
Walter K. Jaros, Aircrafters
Jodee Plastics Co.
Kickhaefer Mfg. Co.
*LAMINATED SHIM CO.
Walter Lee Chemical Corp.
J. E. Menaugh Co.
Mercury Air Parts Co., Inc.
Pic Design Corp., Sub—Benrus Watch Co., Inc.
Pacific Cut Washer Co.
Penn Fibre & Specialty Co., Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Raybestos Manhattan, Inc.
Rubbercraft Corp. of California
Silicone Insulation, Inc.
Wm. Steinen Mfg. Co.
A. T. Stevens Co.
Techniques, Inc.
Thompson-Bremer & Co.
Tricon Mfg. Co.
Waldom Electronics Inc.
Wrought Washer Mfg. Co.

WATER INJECTION EQUIPMENT

Aero Supply Mfg. Co., Inc.
Barnstead Still & Demineralizer Co.
Bendix Products Div., Bendix Aviation Corp.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Walter J. Hyatt Co., The
Hydra-Power Corp.
National Airoil Burner Co.
Milton Roy Co.
Wells Industries Corp.

WAX

Barium & Chemicals, Inc.
Biwax Corp.
General Cement Mfg. Co., Div.-Textron Inc.
International Wax Refining Co.
Merix Chemical Co.
Penetone Co., The
L. Sonneborn & Sons, Inc., Building Products Div.
Trio Chemical Works, Inc.
United Shoe Machinery Corp.
Zophar Mills Inc.

WEDGES, WOOD SLOT

Allied Plastics Supply Corp.

WIRE

Allied Plastics Supply Corp.
*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Associated American Winding Co., Inc.
Birnbach Radio Co., Inc.
Carpenter Steel Co., The
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
Engelhard Industries Inc., D. E. Makepeace Div.
Fort Wayne Metals, Inc.
General Cable Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Walter K. Jaros, Aircrafters
Jefferson Products Corp.
Leeds & Northrup Co.
Metals & Controls Corp.
Plastoid Corp.
Precision Tube Co., Inc.
Republic Steel Corp.
John A. Roeblings Sons Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Thermax Wire Corp.
Titan Metal Mfg. Co.
Western International Co.
Westwood Cable Corp.

Guy

*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Barker Sales Co.
Copperweld Steel Co., Wire & Cable Div.
General Cable Corp.
*HUDSON WIRE CO.
Walter K. Jaros, Aircrafters
National-Standard Co.
John A. Roeblings Sons Corp.
Wind Turbine Co.

Mesh

*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
J. Bishop & Co. Platinum Works
Cambridge Wire Cloth Co., The
Chase Brass & Copper Co., Inc.
Cuno Engrg. Corp., The

Delta Chemical Works, Inc.
General Cable Corp.
*HUDSON WIRE CO.
Michigan Wire Cloth Co.
National-Standard Co.
Newark Wire Cloth Co.
F. H. Paul & Stein Brothers, Inc.
Techniques, Inc.
Wind Turbine Co.

Metal Plated

Associated American Winding Co., Inc.
Bram Metallurgical & Chemical Co.
Chester Cable Corp.
Cuno Engrg. Corp., The
Delta Chemical Works, Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
General Cable Corp.
*HUDSON WIRE CO.
Metals & Controls Corp.
National-Standard Co.
Secon Metals Corp.
Standard Metals Corp.
Surprenant Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Western International Co.

Metal Shielded

Alden Products Co.
Alpha Wire Corp.
American Super Temperature Wires Inc.
Associated American Winding Co., Inc.
Bram Metallurgical & Chemical Co.
William Brand & Co., Inc.
Co-Operative Industries, Inc.
Delta Chemical Works, Inc.
General Cable Corp.
Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Miljan Div., Paul Omohundro Co.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Precision Tube Co., Inc.
Rex Corp., The
Royal Electric Corp.
Sequoia Wire Co.
Times Wire & Cable Co., Inc.
Western International Co.
Westwood Cable Corp.

Molybdenum

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
*HUDSON WIRE CO.
Johnston & Funk Titanium Corp.
Micro-Wire Tungsten & Molybdenum Products

Monel

J. Bishop & Co. Platinum Works
Boston Insulated Wire & Cable Co.
Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
*HUDSON WIRE CO.
Walter K. Jaros, Aircrafters
Johnston & Funk Titanium Corp.
Sylvania Electric Products Inc., Parts Div.

Nickel Clad Copper

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Associated American Winding Co., Inc.
Belden Mfg. Co.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
*HUDSON WIRE CO.
Leach & Garner Co., Industrial Div.
Lewis Engrg. Co., The
Metals & Controls Corp.
Standard Metals Corp.
Sylvania Electric Products Inc., Parts Div.

Phosphor Bronze

Alpha Wire Corp.
American Brass Co., The
Belden Mfg. Co.
Bram Metallurgical & Chemical Co.
Brigeport Brass Co.
Chase Brass & Copper Co., Inc.
Consolidated Wire & Associated Companies
Delta Chemical Works, Inc.
Engelhard Industries Inc., W. E. Makepeace Div.
General Cable Corp.
Hackensack Cable Corp.
*HUDSON WIRE CO.
Westwood Cable Corp.

Plastic Insulated

Accurate Insulated Wire Corp.
Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Barker Sales Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
William Brand & Co., Inc.
Chase Brass & Copper Co., Inc.
Chester Cable Corp.
Electric Auto-Lite Co., The
Electric Parts Corp.
Enflo Corp.
Essex Wire Corp.
General Cable Corp.
Hitemp Wires, Inc.
Jefferson Products Corp.
Lewis Engrg. Co., The
Mohawk Wire & Cable Corp.
Okonite Co., The
Packard Electric Div.-General Motors Corp.
Plastic Age Sales, Inc.
Plastoid Corp.
Rex Corp., The
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Royal Electric Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Western International Co.
Westwood Cable Corp.

Platinum

Anchor Metal Co. Inc.
Associated American Winding Co., Inc.
J. Bishop & Co. Platinum Works
Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eastern Smelting & Refining Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Goldsmith Brothers Smelting & Refining Co.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
National Standard Co.
J. M. Ney Co., The
Secon Metals Corp.
Tricon Mfg. Co.
Western Gold & Platinum

Recording

*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Sequoia Wire Co.
Telectro Industries Corp.
Western International Co.

Reels

*HUDSON WIRE CO.

Silicon Bronze

Alpha Wire Corp.
American Brass Co., The
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
Delta Chemical Works, Inc.
General Cable Corp.
Hackensack Cable Corp.
*HUDSON WIRE CO.
Surprenant Mfg. Co.
Westwood Cable Corp.

Silver Plated

Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Alpha Wire Corp.
American Electric Cable Co.
Belden Mfg. Co.
Bram Metallurgical & Chemical Co.
Chester Cable Corp.
Wilbur B. Driver Co.
Eastern Smelting & Refining Corp.
Elmet Div.-North American Philips Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Goldsmith Brothers Smelting & Refining Co.
Leach & Garner Co., Industrial Div.
Lewis Engrg. Co., The
Metals & Controls Corp.
Micro-Wire Tungsten & Molybdenum Products
Sequoia Wire Co.
Standard Metals Corp.
Sylvania Electric Products Inc., Parts Div.
Times Wire & Cable Co., Inc.
Westwood Cable Corp.

Stainless Steel

All Boro Metal Products Co., Inc.
*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Armco Steel Corp.
Bram Metallurgical & Chemical Co.
Carpenter Steel Co., The
Chase Brass & Copper Co., Inc.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Electric Steel Foundry Co.
Firth Sterling Inc.
Fort Wayne Metals, Inc.
Walter K. Jaros, Aircrafters
Johnston & Funk Titanium Corp.
National-Standard Co.
Republic Steel Corp.
John A. Roeblings Sons Corp.
Joseph T. Ryerson & Son, Inc.
Sylvania Electric Products Inc., Parts Div.
Vacuum Metals Corp., Div.-Crucible Steel Co. of America

Tantalum

Bram Metallurgical & Chemical Co.
Consolidated Wire & Associated Companies
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Fansteel Metallurgical Corp.
Haynes Stellite Co., Div.-Union Carbide Corp.
Johnston & Funk Titanium Corp.
Kennametal Inc.
Metals & Controls Corp.
F. H. Paul & Stein Brothers, Inc.

Thermocouple

Aero Research Instrument Co. Inc.
American Electric Cable Co.
Berkshire Electric Cable Co.
J. Bishop & Co. Platinum Works
Consolidated Wire & Associated Companies
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
General Cable Corp.
Harco Labs., Inc.
Illinois Testing Laboratories, Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Metals & Controls Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Standard Co.
Okonite Co., The
Thermo Electric Co., Inc.
Times Wire & Cable Co., Inc.
Westwood Cable Corp.

Titanium

Bram Metallurgical & Chemical Co.
Crucible Steel Co. of America
Delta Chemical Works, Inc.
Wilbur B. Driver Co.
Eisler Engrg. Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Firth Sterling Inc.
Johnston & Funk Titanium Corp.
P. R. Mallory & Co. Inc.
Metals & Controls Corp.
National-Standard Co.

Tungsten

Bram Metallurgical & Chemical Co.
Delta Chemical Works, Inc.
Eisler Engrg. Co., Inc.
Elmet Div.-North American Philips Co., Inc.
Fansteel Metallurgical Corp.
Fromson Orban Co., Inc.
Micro-Wire Tungsten & Molybdenum Products

Zirconium

Bram Metallurgical & Chemical Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Firth Sterling Inc.
Foote Mineral Co.
Johnston & Funk Titanium Corp.
Metals & Controls Corp.

WIRE STRIPPERS

Artos Engrg. Co.
Electric Auto-Lite Co., The
Eraser Co., Inc., The
Fidelity Chemical Products Corp.
Holub Industries, Inc.
Ideal Industries, Inc.
London Chemical Co., Inc.
Wm. Steinen Mfg. Co.
Thomas Instrument Co.
Wenco Mfg. Co.
Wye Industries

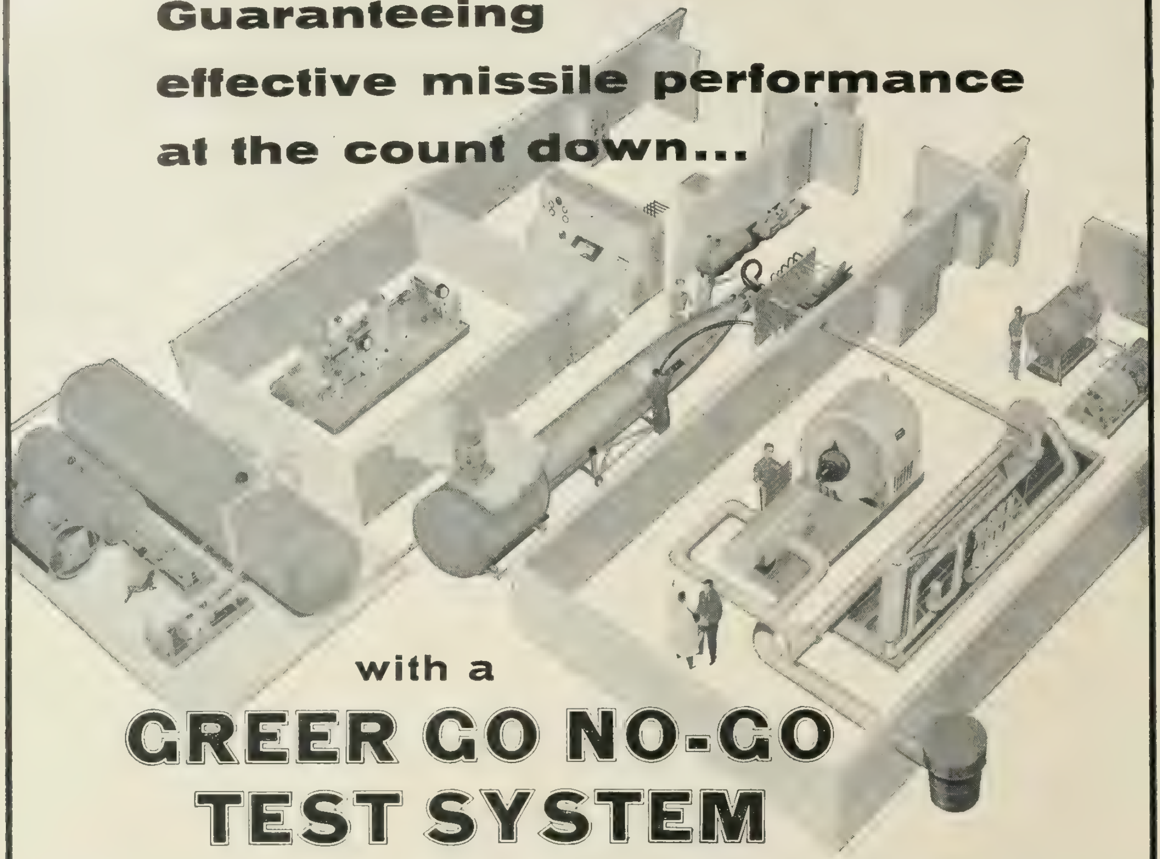
ZINC

Accurate Specialties Co. Inc.
American Silver Co.
Anchor Metal Co. Inc.
Belmont Smelting & Refining Works, Inc.
Delta Chemical Works, Inc.
Eagle-Picher Co., The
Harmon, Lichtenstein & Co.

ZIRCONIUM

American Silver Co.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
*COOPER DEVELOPMENT CORP.
Delta Chemical Works, Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
Firth Sterling Inc.
Foote Mineral Co.
Harvey Aluminum
Johnston & Funk Titanium Corp.
Metals & Controls Corp.
Twix Mfg., Inc.

Guaranteeing effective missile performance at the count down...



with a

GREER GO NO-GO TEST SYSTEM

Missile readiness at the launching site is assured when put through its paces with a Greer Go No-Go Test System. Take for example the above missile test facility recently completed for a leading manufacturer of missiles.*

This unique Go No-Go System automatically and accurately tests missiles off the production line. The system encompasses every type of missile test including fuel, pneumatic, hydraulic, electrical, mechanical—all equipment designed, developed and built right in the Greer plant.

The fool-proof test system programs and schedules 32 different inputs for Go No-Go readout, and self-checks each input for accuracy before the actual test. Its special and multiple circuits provide rapid determination and isolation of defective parts in the missile. In addition, the equipment signals accurate operation of its own test circuits and components. All test conditions, altitude, speed, pressure, temperature, etc., are simulated and accurately controlled to match those in actual missile flight.

Bring your out-of-ordinary missile test problems to Greer. At your disposal is Greer's vast test equipment experience and know-how, Greer's staff of creative engineers and skilled technicians—plus a fully-equipped plant to do the job for on-time delivery. For immediate action contact Greer.

**For details, contact Greer sales manager, test equipment division.*

GREER GROUND SUPPORT EQUIPMENT

MISSILE GO NO-GO SYSTEMS

MISSILE LAUNCHING SYSTEMS

MISSILE GAS BOOSTER SYSTEMS

GREER HYDRAULICS, INC. • NEW YORK INTERNATIONAL AIRPORT • JAMAICA 30, NEW YORK

GROUND SUPPORT EQUIPMENT

This is the equipment that supports the missiles; such as, "go, no-go" boxes and other electronic checkout gear, liquid oxygen generators, fuel trucks, fire trucks, portable generators, launching pads and block-houses.

Announcing a specialized

MISSILE SUPPORT SERVICE

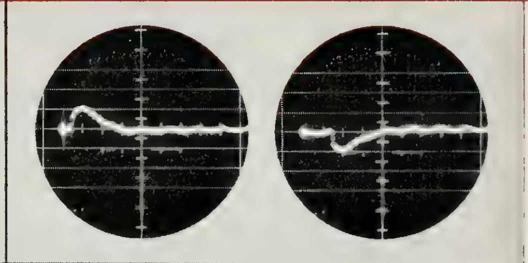
You worry about the missile . . . let Packard Bell Electronics take care of ground support! Proven performance in this field has resulted in a separate missile equipment section devoted exclusively to ground test and launching equipment. Here, in a 21,500 sq. ft. facility geared for short run production, experienced management shoulders complete responsibility. Here the most radical design changes are absorbed during the process of development. Here direct assembly supervision by production engineers eliminates costly and time-consuming delays. A reliable source, any way you look at it. And a reliable way to rid yourself of a major headache!

ENGINEERING BEYOND THE EXPECTED

DESIGN—When time dictates, available equipment can be adapted to your specifications. But you receive custom design, *beyond the expected*, when you need it. For example, the transistorized MAGAMP power supply (right). This unit provides a faster response time . . . a lower overshoot and undershoot . . . and remote regulation at longer distances than has ever been achieved before with this type of power supply.

DELIVERY—A contract from Douglas Aircraft for "Thor" test equipment was awarded in March 1956. A total of 100 units, comprising 30 different units, was delivered before deadline in November. On-time delivery at its best . . . delivery *beyond the expected*.

This transistorized MAGAMP power supply delivers a 27V to 42V output at 0 to 300 amperes, *regulated at a load up to several hundred feet away*.



The MAGAMP has a surge capacity of 400% overload for 2 seconds. Regulation at the load is 1% or better. Recovery time is less than 50 milliseconds. Overshoot and undershoot are less than 25%, with a 30% change in load. (Scale in above photos: 5V/CM and 10MS/CM.)

PACKARD BELL ELECTRONICS
Missile Equipment Section
Technical Products Division
12333 W. Olympic Blvd.
Los Angeles 64, Calif. · BRadshaw 2-2171

GROUND SUPPORT EQUIPMENT

ACTUATORS, PNEUMATIC

Aeroproducts Operations, Allison Div., General Motors Corp.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Arkwin Industries, Inc.
Barber-Colman Co.
Bendix Products Div, Bendix Aviation Corp.
Bridgwater Machine Co.
CDC Control Services, Inc.
Clary Dynamics
Clemco Aero Products, Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Consolidated Controls Corp.
Consolidated Diesel Electric Corp., Test Equip. Div.
*CORNELIUS CO., THE
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ex-Cello-O Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geartronics Corp.
General Nuclear Corp.
*GREER HYDRAULICS, INC.
Hagan Chemicals & Controls, Inc.
Hahn & Clay
Hydra-Power Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Lyndon Aircraft, Inc.
McDowell Co. Inc.
Menasco Mfg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Nemeth, Inc.
O & M Machine Co., Inc.
Pacific Coast Engrg. Co.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Progressive Research & Development Co., Inc.
Research Controls
Sancor Corp.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Tactair Valve Div.-Aircraft Products Co.
Talco Engrg. Co., The
Talley Corp., The
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vap-Air Div., Vapor Heating Corp.
Vard Inc.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Wells Industries Corp.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.

AMPLIFIERS, TONE CONTROL

Adler Electronics, Inc.
Amelco, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Cedar Engrg. Div.-Control Data Corp.
*AVCO MFG. CORP., CROSLEY DIV.
Consolidated Radio Products Co.
*DATA-CONTROL SYSTEMS INC.
Daven Co., The
Dunlap Electronics, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Goslin Electric & Mfg. Co.
*INTERELECTRONICS CORP.
Kay Electric Co.
La Pointe Industries Inc.
Lenkurt Electric Co., Inc.
Philco Corp., Government & Industrial Divs.
Production Research Corp.
Ram Electronics Inc.
Resdel Engrg. Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
United Electrodynamics, Div.-United Geophysical Corp.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.
Wilcox Electric Co., Inc.
Wunderlich Radio Co.

ANALYZERS, CABLE

Bogue Electric Mfg. Co.
California Technical Industries, Div.-Textron Inc.
James Cunningham Son & Co., Inc.
Dit-Mco. Inc. Electronics Div.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Guardian Electric Mfg. Co.
Hammett Electric Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kay Electric Co.
Lane Electronics Mfg. Corp.
Minco Products, Inc.
Radar Engineers
Telectro Industries Corp.

ANTENNA TOWER LIGHTING

Hammett Electric Co.
J-V-M Microwave Co.
Motorola Inc., Military Marketing Div.
Prodelin Inc.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Twix Mfg. Co., Inc.
*WESTINGHOUSE ELECTRIC CORP.
*WASHINGTON ALUMINUM CO., INC.
Wind Turbine Co.
Wunderlich Radio Co.

ANTENNAS, MOBILE COMMERCIAL

Ainslie Corp.
American Electronics Labs., Inc.
Andrew Corp.
Canoga Corp. of California
Coaxial Connector Co. Inc.
Collins Radio Co.
Communications Co.
*DALMO VICTOR CO.-TEXTRON INC.
Defiance Engrg. & Microwave Corp.
*DORNE & MARGOLIN, INC.
Freeman Co., The
General Electric Co., Missiles & Ordnance Systems Dept. (Pa.)
General Railway Signal Co.
Hammett Electric Co.
J-V-M Microwave Co.
Kelsey-Hayes Co.
Herb Kreckman Co.
La Pointe Industries Inc.
Leitch Engrg. Corp.
Mark Products Co.
Missile Engrg. Products, Inc.
Motorola Inc., Military Marketing Div.
Permax Products Div., Chisholm-Ryder Co., Inc.
Prodelin Inc.
Robot Appliances Inc.
Scala Radio Co.
Technical Appliance Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
*WASHINGTON ALUMINUM CO., INC.
Wunderlich Radio Co.

ANTENNAS, MOBILE COMMUNICATION

Ainslie Corp.
Aircraft Armaments, Inc.
American Brass Co., The
American Electronics Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Canoga Corp. of California
Collins Radio Co.
Communications Co.
*COOPER DEVELOPMENT CORP.
Defiance Engrg. & Microwave Corp.
*DORNE & MAGOLIN, INC.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Freeman Co., Inc.
Gabriel Co., The Gabriel Electronics Div.
General Electric Co., Missile & Ordnance Dept. (Pa.)
Haller Raymond & Brown Inc.
Hammett Electric Co.
Hycon Eastern Inc.
Kelsey-Hayes Co.
D. S. Kennedy & Co.
Herb Kreckman Co.
La Pointe Industries Inc.
Mark Products Co.
Missile Engrg. Products, Inc.
Motorola Inc., Military Marketing Div.
Permax Products Div., Chisholm-Ryder Co., Inc.
Phaostron Instrument & Electronic Co.
Reeves Instrument Corp.
Robot Appliances Inc.
Scala Radio Co.
Technical Appliance Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Twix Mfg. Co., Inc.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
*WASHINGTON ALUMINUM CO., INC.
Wunderlich Radio Co.

ASPHALT

Esso Standard Oil Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Prodelin Inc.
Sanders Associates, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.

ASSEMBLIES, CABLE

*AC SPARK PLUG DIV. GENERAL MOTOR CORP.
ACF Industries, Inc., Advanced Products Div.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
Alden Products Co.
All American Aircraft Products, Inc.
Alpha Wire Corp.
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Super-Temperature Wires, Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Co., Inc.
Bergen Wire Rope Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Centronix Inc.
Coaxial Connector Co. Inc.
*COOPER DEVELOPMENT CORP.
Cromer Mfg. & Engrg., Inc.
Dale Products, Inc.
Dittmore-Freimuth Corp.
Dwyer Engrg. Co., Inc.
Electric Auto-Lite Co., The
Electronic Assembly Co., Inc.
Essex Mfg. Co., Inc.
First Electronics Corp., The
Food Machinery & Chemical Corp., Ordnance Div.
General Railway Signal Co.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Guardian Electric Mfg. Co.
Hallamore Electronics Co.
Hallett Mfg. Co.
Hammett Electric Co.
Hi-Lo Manufacturing Corp.
Hoover Electronics Co.
International Electric Industries, Inc.
Walter K. Jaros, Aircrafters
Lane Electronics Mfg. Corp.
Lenkurt Electric Co., Inc.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Missile Engrg. Products, Inc.
J. J. Monaghan Co., Inc.
Organic Development Corp., Spectra-Strip Div.
Phaostron Instrument & Electronic Co.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Resdel Engrg. Corp.
John A. Roeblings Sons Corp.
Rowe Industries
Schaeffer Air Industries, Inc.
Sittler Corp.
Superex Electronics Corp.
Surprenant Mfg. Co.
Telectro Industries Corp.
Teleflex Inc.
Transvision, Inc.
Tricraft Products Corp.
Tri-Dex Co.
Tucson Instrument Corp.
Twix Mfg. Co., Inc.
Victor Electric Wire & Cable Corp.
Wells Industries Corp.
Westbury Electronics Inc.

PHOTO ON GROUND SUPPORT EQUIPMENT DIVIDER PAGE: The North American NAVAHO missile is shown being readied for flight tests.

Western International Co.
Westronics Inc.
Westwood Cable Corp.
Wickfield, Inc.
Winder Aircraft Corp. of Fla.
Zippertubing Co., The

ASSEMBLY EQUIPMENT, AUTOMATIC

Abrams Instrument Corp.
Alden Systems Co.
*AMERICAN MACHINE & FOUNDRY CO.
Davenport Mfg. Co.
Food Machinery & Chemical Corp., Ordnance Div.
Guardian Electric Mfg. Co.
Hallamore Electronics Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Merz Engrg., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Telectro Industries Corp.
Twix Mfg. Co., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Winder Aircraft Corp. of Fla.

AUXILIARY POWER SOURCES

Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Louis Allis Co., The
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Products Div, Bendix Aviation Corp.
Cadillac Gage Co.
Consolidated Diesel Electric Corp., Test Equip. Div.
Davenport Mfg. Co.
Joe Davidson & Associates
Food Machinery & Chemical Corp., Ordnance Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Goodyear Aircraft Corp.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Kurz & Root Co.
J. A. Maurer, Inc.
McCormick Selph Associates
Missile Engrg. Products, Inc.
Motoresearch Co.
Propellex Chemical Corp.
Reaction Motors, Inc.
Ready Power Co., The
Rucker Co., The
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Telectro Industries Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
*WESTINGHOUSE ELECTRIC CORP.
Wickfield, Inc.
Wickes Engrg. & Construction Co., Inc.
Winder Aircraft Corp. of Fla.

BALL BEARINGS

Ahlberg Bearing Co.
American Welding & Mfg. Co., The
Barden Corp., The
Corning Glass Works
Dodge Mfg. Corp.
Federal Bearings Co. Inc., The
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Marlin-Rockwell Corp.
McGill Mfg. Co. Inc.
Monarch Aircraft Sales, Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Raway Bearing Co.
Solar Aircraft Co.
United Supply Co.

BALL JOINTS

Allegany Instrument Co., Inc.
Bridgwater Machine Co.
Century Fasteners Corp.
Corbin Products Div.
Walter K. Jaros, Aircrafters
Parker Aircraft Co.
Ryan Aeronautical Co.
Southwest Products Co.
United Supply Co.
Vickery Co., The

BASES

Ainslie Corp.
*AMERICAN MACHINE & FOUNDRY CO.
American Steel Foundries, Hammond Div.
Bridgwater Machine Co.
Cromer Mfg. & Engrg., Inc.
G. M. Dykes Iron Works, Inc.
Federal Machine Co. Inc.
R. C. Mahon Co., The
Peterson & Neville Inc.
Philips & Davies Inc.
Ray-O-Vac Co., Div.-Electric Storage Battery Co.
Thompson Products, Inc.
*WASHINGTON ALUMINUM CO., INC.

BATTERIES

Associated Co., Inc.
Bowers Battery & Spark Plug Co.
Burgess Battery Co.
Carbone Corp., The
Eagle-Picher Co., The
Electric Auto-Lite Co., The
*EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.
Goldsmith Brothers Smelting & Refining Co.
*INTERELECTRONICS CORP.
P. R. Mallory & Co. Inc.
Modglin Co. Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Terminal Radio Corp.
Willard Storage Battery Div.
Yardney Electric Corp.

BATTERY BOXES, CRADLES, ETC.

Aerolite Electronics Corp.
Aircraft Mechanics, Inc.
G. M. Dykes Iron Works, Inc.
Ludwig Honold Mfg. Co.
Keystone Electronics Corp.
Modglin Co. Inc.
Muckle Mfg. Co.
Plastic Age Sales, Inc.
Resdel Corp.
Smith-Morris Corp.
Telectro Industries Corp.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

BATTERY SERVICING EQUIPMENT

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Amelco, Inc.
Christie Electric Corp.
*EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.
General Scientific Equipment Co.
Green Rectifier Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Krylon, Inc.
Leach Corp.
Lee Electric & Mfg. Co.
George L. Nankervis Co.
Quick Charge Corp.
Sun Electric Corp.
Telectro Industries Corp.
Willard Storage Battery Div.
Winder Aircraft Corp. of Fla.
Yardney Electric Corp.

BEACONS, CRASH LOCATOR

Aircraft Armaments, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Canoga Corp. of California
*COOPER DEVELOPMENT CORP.
*DATA-CONTROL SYSTEMS INC.
Hallamore Electronics Co.
J-V-M Microwave Co.
Kemlite Laboratories, Inc.
W. L. Maxson Corp., The
Motorola Inc., Military Marketing Div.
Resdel Engrg. Corp.
Simmonds Aerocessories, Inc.
Stanley Aviation Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.

BINS

Alden Systems Co.
Aluminum Co. of America
Bekins Industrial Packaging
Butler Mfg. Co.
Cromer Mfg. & Engrg., Inc.
G. M. Dykes Iron Works, Inc.
Luria Engrg. Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The
Warren Mfg. Div.-Warren Brothers Roads Co.
Winder Aircraft Corp. of Fla.

BLADDERS, FUEL

Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
B. F. Goodrich Aviation Products
Irving Air Chute Co., Inc.
Joclin Mfg. Co.
New England Tape Co., Inc.
Portland Copper & Tank Works Inc.
Rubbercraft Corp. of California

BLADES, HACKSAW

Capewell Mfg. Co.
Ladish Co.
Simonds Saw & Steel Co.
L. S. Starrett Co., The

BOLT CARTRIDGES, EXPLOSIVE

Atlantic Research Corp.
Beckman & Whitley, Inc., Missile Products Div.
*COOPER DEVELOPMENT CORP.
McCormick Selph Associates
Propellex Chemical Corp.
Stanley Aviation Corp.
Talco Engrg. Co., The
Winchester-West. Div.-Olin Mathieson Chem. Corp.

BOXES

Aircraft Mechanics, Inc.
Basic Tool Industries, Inc.
Bekins Industrial Packaging
Champion Airquipment Inc.
Champion Co., The
*CRAIG SYSTEMS, INC.
*ECKOL PACKAGING CO.
Muckle Mfg. Co.
Plastic Age Sales, Inc.
Skydyne Inc.
Smith-Morris Corp.
TA Mfg. Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
United Mfg. Co., The
Warren Mfg. Div.-Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

BRACKETS, HARDWARE

Abalon Precision Mfg. Corp.
Aerolite Electronics Corp.
Air Logistics Corp.
American Brass Co., The
*AMERICAN MACHINE & FOUNDRY CO.
Basic Tool Industries, Inc.
Dumont Aviation Associates
Electronic Techniques, Inc.
Joclin Mfg. Co.
Keystone Electronics Corp.
Pacific Cut Washer Co.
Republic Aviation Corp., Guided Missiles Div.
Rome Cable Corp.
Smith-Morris Corp.
TA Mfg. Corp.
Thompson Products, Inc.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

BREAK-AWAY MECHANISMS

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
Aerotex Corp., The
*AMERICAN MACHINE & FOUNDRY CO.
Beckman & Whitley, Inc., Missile Products Div.
Bendix Products Div., Bendix Aviation Corp.
*COOPER DEVELOPMENT CORP.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Republic Aviation Corp., Guided Missiles Div.
Stanley Aviation Corp.
Talco Engrg. Co., The
Telectro Industries Corp.
Thompson Products, Inc.
Turbo Products, Inc.
Washington Technological Associates Inc.
Winder Aircraft Corp. of Fla.

BULBS, TEMPERATURE RESISTANT

A&P Metal Products Mfg. Corp.
Lewis Engrg. Co., The

CABINET COVERING

A&P Metal Products Mfg. Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Basic Tool Industries, Inc.
Consolidated Radio Products Co.
Duracote Corp.
Ludwig Honold Mfg. Co.
Henry & Miller Industries, Inc.
Muckle Mfg. Co.
Multi-Amp Corp.
Peterson & Neville Inc.
*WASHINGTON ALUMINUM CO., INC.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.
Zero Mfg. Co.

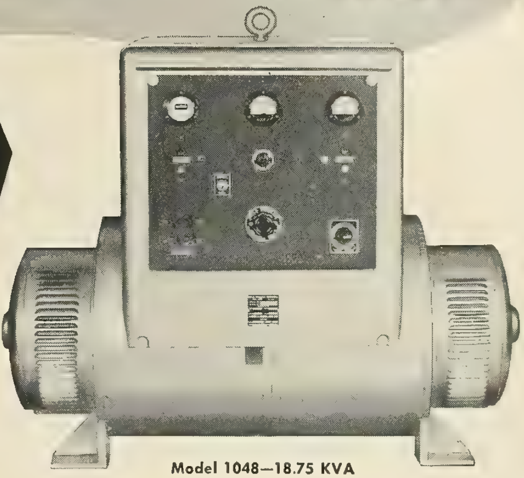
CABINETS, SPEAKER

A&P Metal Products Mfg. Corp.
Calcor Corp. Aircraft Div.
Longren Aircraft Co., Inc.
Henry & Miller Industries, Inc.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

CABINETS, WOOD

Anchor Specialty Mfg. Co. Inc.
Bekins Industrial Packaging
Consolidated Wire & Associated Companies

GET EXACTLY 400 CYCLES PER SECOND WITH HOBART SYNCHRONOUS MOTOR GENERATORS



Model 1048—18.75 KVA

FEATURES:

- Simplified Design
- Rugged Construction
- Dependable Performance
- Ease of Installation and Maintenance

USES:

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- Flight Control Stations
- Communication and Navigation Systems
- Instrument and Maintenance Workshops

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Impressive in power and performance, Hobart Ground Power Support Units (d.c.) are known throughout the world as the chosen ground power unit in the commercial aviation field.

With the advent of jet aircraft, the merits of an a.c. electrical system is unquestionably the right choice, so the need for 400 cycle power is urgent. Research by Hobart indicates that units ranging from 3.75 KVA to 125 KVA are required. Design, development, and production of these new units are in progress at M.G.C. The Hobart d.c. line will, of course, take care of the limited supply of low voltage d.c. requirements on certain jet aircraft.

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- Induction MotoDrive generators (380 to 420 cycles)—vari-speed drive
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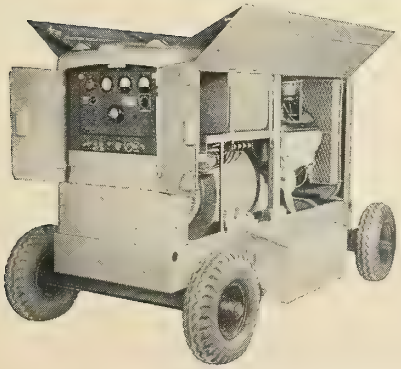
- Engine-driven generators, self-propelled—gasoline or Diesel
- Trailer-mounted engine generators—gasoline or Diesel
- Truck-mounted engine generators—gasoline or Diesel

Checked to your specifications . . . Shipped to your schedules!

Model 3008-P
37.5 KVA



REGARDLESS OF COST . . .

you can't get a better frequency changer than Hobart because of these outstanding features:

- Complete instrumentation
- Magnetic type load contactor
- Voltage regulation is by a magnetic amplifier
- Overload relay opens the main contactor on overloads
- Over-voltage relay protects the aircraft in case of excessive voltage
- Transient voltage, output voltage modulation, response time, and wave shape are held to the closest possible limits

TO OPEN THE WAY TO FASTER FLIGHT SCHEDULES, SMALLER FLEET REQUIREMENTS AND INCREASED PROFITS—WRITE FOR COMPLETE INFORMATION INCLUDING DESCRIPTIVE LITERATURE DETAILING CONSTRUCTION, RATINGS, TYPES, SIZES, AND SERVICE CHARACTERISTICS.

MOTOR GENERATOR CORPORATION

Box MI-48 **Troy, Ohio** *(Hobart Brothers Affiliate)*

HOBART

Elm Mfg. Co. Inc.
Sanders Associates, Inc.
Terminal Radio Corp.
Wells Industries Corp.

CABLE

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alpha Wire Corp.
American Super-Temperature Wires, Inc.
Ansonia Wire & Cable Co., The
Associated Co., Inc.
Belden Mfg. Co.
Bergen Wire Rope Co.
Birnbach Radio Co., Inc.
Consolidated Wire & Associated Companies
Dittmore-Freimuth Corp.
Dwyer Engrg. Co., Inc.
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hallett Mfg. Co.
International Electric Industries, Inc.
Jefferson Products Corp.
*KAHN & CO., INC.
Pacific Automation Products, Inc.
Plastoid Corp.
Precision Tube Co., Inc.
Prodelin Inc.
Rex Corp., The
John A. Roeblings Sons Corp.
Rome Cable Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Thermax Wire Corp.
United States Plastic Rope, Inc.
Warren Wire Co.
Western International Co.
Winder Aircraft Corp. of Fla.
Zippertubing Co., The

Antenna Transmission

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
American Electric Cable Co.
Andrew Corp.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Coaxial Connector Co. Inc.
Consolidated Wire & Associated Companies
Dayton Aircraft Products, Inc.
Dittmore-Freimuth Corp.
Empire Electronics Co., Inc.
Hackensack Cable Corp.
International Electric Industries, Inc.
Jefferson Products Corp.
Key Resistor Corp.
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Mohawk Wire & Cable Corp.
Okonite Co., The
Plastoid Corp.
Precision Tube Co., Inc.
Prodelin Inc.
Rex Corp., The
Royal Electric Corp.
Sequoia Wire Co.
Technical Appliance Corp.
Terminal Radio Corp.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Tucson Instrument Corp.
Twix Mfg. Co., Inc.
Warren Wire Co.
Westbury Electronics Inc.
Western International Co.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Assemblies, Electrical

Advanced Electronics, Inc.
Aerolite Electronics Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alden Products Co.
Alpha Wire Corp.
Amelco, Inc.
American Electric Cable Co.
*AMERICAN MACHINE & FOUNDRY CO.
American Super-Temperature Wires, Inc.
Anchor Specialty Mfg. Co. Inc.
Andrew Corp.
Berkshire Electric Cable Co.
Bliss Electronic Corp.
William Brand & Co., Inc.
California Technical Industries
Coaxial Connector Co., Inc.
*COOPER DEVELOPMENT CORP.
Dale Products, Inc.
Dittmore-Freimuth Corp.
Dwyer Engrg. Co., Inc.
Elco Corp.
Electric Auto-Lite Co., The, Wire & Cable Div.
Electric Parts Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Empire Electronics Co., Inc.
First Electronics Corp., The
Food Machinery & Chemical Corp., Ordnance Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hallamore Electronics Co.
Hallett Mfg. Co.
Hammett Electric Co.
Harco Labs., Inc.
Hoover Electronics Co.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
*KAHN & CO., INC.
La Pointe Industries Inc.
Lenkurt Electric Co., Inc.
Lewis Engrg. Co., The
Lytle Engrg. & Mfg. Co.
Miljan Div., Paul Omohundro Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Missile Engrg. Products, Inc.
Mutron Corp.
*NORMANDY ELECTRIC WIRE CORP.
Organic Development Corp., Spectra-Strip Div.
Pacific Automation Products, Inc.
Packard Electric Div.-General Motors Corp.
Precision Tube Co., Inc.
Resdel Engrg. Corp.
John A. Roeblings Sons Corp.
Rowe Industries
Royal Electric Corp.
Schaffer Air Industries, Inc.
Sealectric Switch & Relay Corp.
Sequoia Wire Co.
Southwestern Industrial Electronics Co.
Surprenant Mfg. Co.
Teletronic Labs., Inc.
Terminal Radio Corp.
Thermax Wire Corp.
Tri-Dex Co.
Twix Mfg. Co., Inc.
Uniwave, Inc.
Warren Wire Co.
Westbury Electronics Inc.
Western International Co.
Westronics Inc.
Westwood Cable Corp.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.
Wickfield, Inc.
Wilmar Mfg. Co., Inc.
Winder Aircraft Corp. of Fla.
Wire Co. of America, Inc.
Zippertubing Co., The

Assemblies, Mechanical

Aerolite Electronics Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
All American Aircraft Products, Inc.
Anchor Specialty Mfg. Co. Inc.
Arens Controls, Inc.
Associated Co. Inc.
Belden Mfg. Co.
Bergen Wire Rope Co.
Dittmore-Freimuth Corp.
Dynamic Gear Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hallamore Electronics Co.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
La Pointe Industries Inc.
Mutron Corp.
Reid Metal Products, Inc.
John A. Roeblings Sons Corp.
Southwest Products Co.
Technical Oil Tool Corp.
Teleflex Inc.
Teletronic Labs., Inc.
Terminal Radio Corp.
Uniwave, Inc.
Westbury Electronics Inc.
Wickfield, Inc.
Winder Aircraft Corp. of Fla.

Bonding

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alpha Wire Corp.
American Electric Cable Co.
Berkshire Electric Cable Co.
Dittmore-Freimuth Corp.
Hallett Mfg. Co.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
Miljan Div., Paul Omohundro Co.
New England Electrical Works, Inc.
Organic Development Corp., Spectra-Strip Div.
Packard Electric Div.-General Motors Corp.
Terminal Radio Corp.
Twix Mfg. Co., Inc.
Westwood Cable Corp.
Winder Aircraft Corp. of Fla.

Disconnects

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alden Products Co.
*AMERICAN MACHINE & FOUNDRY CO.
Beckman & Whitley, Inc., Missile Products Div.
Belden Mfg. Co.
Coaxial Connector Co. Inc.
Consolidated Wire & Associated Companies
Elco Corp.
Food Machinery & Chemical Corp., Ordnance Div.
Hallamore Electronics Co.
Hallett Mfg. Co.
International Electric Industries, Inc.
Pyle-National Co., The
Scintilla Div.-Bendix Aviation Corp.
Sealectric Switch & Relay Corp.
Terminal Radio Corp.
Western International Co.
Winder Aircraft Corp. of Fla.

Electric

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alpha Wire Corp.
Aluminum Co. of America
American Electric Cable Co.
American Insulated Wire Corp.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Barker Sales Co.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
William Brand & Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Copperweld Steel Co., Wire & Cable Div.
Electric Parts Corp.
Essex Wire Corp.
First Electronics Corp., The
General Cable Corp.
Hallamore Electronics Co.
Hallett Mfg. Co.
Hitemp Wires, Inc.
Lewis Engrg. Co., The
Mohawk Wire & Cable Corp.
*NORMANDY ELECTRIC WIRE CORP.
Organic Development Corp., Spectra-Strip Div.
Pacific Automation Products, Inc.
Packard Electric Div.-General Motors Corp.
Rex Corp., The
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Royal Electric Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Times Wire & Cable Co., Inc.
Warren Wire Co.
Western Insulated Wire Co.
Westwood Cable Corp.
Winder Aircraft Corp. of Fla.
Wire Co., of America, Inc.
Zippertubing Co., The

Flat Woven

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alpha Wire Corp.
American Electric Cable Co.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Cambridge Wire Cloth Co., The
General Cable Corp.
National Standard Co.
New England Electrical Works, Inc.
Pacific Automation Products, Inc.
Packard Electric Div.-General Motors Corp.
John A. Roeblings Sons Corp.
Terminal Radio Corp.
Westwood Cable Corp.
Winder Aircraft Corp. of Fla.

Guards

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Illumitronic Engrg. Co.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Guillotines

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Coaxial Connector Co. Inc.
*COOPER DEVELOPMENT CORP.
McCormick Selph Associates
Propellex Chemical Corp.
Talco Engrg. Co., The
Technical Oil Tool Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Hangars

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Dakota Engrg., Inc.
Prodelin Inc.
Terminal Radio Corp.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

Markers

Acromark Co., The
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alpha Wire Corp.
Associated Co., Inc.
William Brand & Co., Inc.
Roovers-Lotson Corp.
Teletronic Labs., Inc.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.
Zippertubing Co., The

Mechanical

Associated Co., Inc.
Bergen Wire Rope Co.
Boston Insulated Wire & Cable Co.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Hackensack Cable Corp.
John A. Roeblings Sons Corp.
Teleflex Inc.
Terminal Radio Corp.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

Shielded

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alden Products Co.
Alpha Wire Corp.
American Electric Cable Co.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Co-Operative Industries, Inc.
Electric Auto-Lite Co., The
Essex Wire Corp.
General Cable Corp.
Hallett Mfg. Co.
Hitemp Wires, Inc.
Jefferson Products Corp.
Lewis Engrg. Co., The
Miljan Div.-Paul Omohundro Co.
Mohawk Wire & Cable Corp.
Okonite Co., The
Organic Development Corp., Spectra-Strip Div.
Pacific Automation Products, Inc.
Packard Electric Div.-General Motors Corp.
Precision Tube Co., Inc.
Prodelin Inc.
Rex Corp., The
John A. Roeblings Sons Corp.
Rome Cable Corp.
Royal Electric Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Times Wire & Cable Co., Inc.
Western International Co.
Westwood Cable Corp.
Winder Aircraft Corp. of Fla.
Wire Co. of America, Inc.
Zippertubing Co., The

Splicers

AMP Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Blonder-Tongue Labs., Inc.
Dittmore-Freimuth Corp.
Magnetic Shield Div.-Perfection Mica Co.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Tensioners

Consolidated Wire & Associated Companies
Phelps Dodge Copper Products Corp.
Prodelin Inc.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Transmission Lines

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aluminum Co. of America
American Electric Cable Co.
American Super Temperature Wires Inc.
Andrew Corp.
Ansonia Wire & Cable Co., The
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
General Cable Corp.
International Electric Industries, Inc.
Jefferson Products Corp.
Lee Electric & Mfg. Co.
Mohawk Wire & Cable Corp.
*NORMANDY ELECTRIC WIRE CORP.
Okonite Co., The
Phelps Dodge Copper Products Corp.
Plastoid Corp.
Precision Tube Co., Inc.
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Royal Electric Corp.
Sequoia Wire Co.
Technical Appliance Corp.
Terminal Radio Corp.
Times Wire & Cable Co., Inc.
Uniwave, Inc.
Western International Co.
Westwood Cable Corp.
Winder Aircraft Corp. of Fla.

Wire

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alpha Wire Corp.
Aluminum Co. of America
American Electric Cable Co.
American Insulated Wire Corp.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
William Brand & Co., Inc.
Chester Cable Corp.
Consolidated Radio Products Co.
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
Electric Parts Corp.
Essex Wire Corp.
First Electronics Corp., The
General Cable Corp.
Hackensack Cable Corp.
Jefferson Products Corp.
Lewis Engrg. Co., The
Micro-Wire Tungsten & Molybdenum Products
New England Electrical Works, Inc.
*NORMANDY ELECTRIC WIRE CORP.
Organic Development Corp., Spectra-Strip Div.
Pacific Automation Products, Inc.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Rex Corp., The
John A. Roeblings Sons Corp.
Rome Cable Corp.
Royal Electric Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Warren Wire Co.
Westwood Cable Corp.
Winder Aircraft Corp. of Fla.
Wire Co. of America, Inc.

CAMERA MOUNTS

Abrams Instrument Corp.
Aeroflex Corp., The, Aeroflex Labs. Div.
*AMERICAN MACHINE & FOUNDRY CO.
Associated Co., Inc.
Benson-Lehner Corp.
Cameraflex Corp.
G. M. Dykes Iron Works, Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
G. W. Galloway Co.
Goodyear Aircraft Corp.
Graflex, Inc.
Hallamore Electronics Co.
Houston Fearless Corp.
Huber Industries, Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Robinson Aviation, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Twix Mfg. Co., Inc.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Washington Technological Associates Inc.
Winder Aircraft Corp. of Fla.
Wollensak Optical Co.

CANS, HERMETICALLY SEALED

American Brass Co., The
Applied Design Co.
Champion Co., The
Conco Engrg. Works
Electrical Industries, Div.-Philips Electronics, Inc.
Electronic Techniques, Inc.
Great Eastern Metal Products Co.
Ludwig Honold Mfg. Co.
Kelsey-Hayes Co.
Modglin Co. Inc.
Philco Corp., Government & Industrial Divs.
*RHEEM MFG. CO., AIRCRAFT DIV.
Sealectric Switch & Relay Corp.
Seamless Products Co., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Wells Industries Corp.
Zero Mfg. Co.

CARBIDES

Bergen Carbide Co.
Firth Sterling Inc.
Walter J. Hyatt Co., The
Kennametal Inc.

CASES, INSTRUMENT & METER

Aerodex, Inc.
Applied Design Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
C. R. Daniels, Inc.
Falstrom Co.
Fischer & Porter Co.
Hammett Electric Co.
Ideal-Aerosmith, Inc.
*KAHN & CO., INC.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Muckle Mfg. Co.
Multi-Amp Corp.
Olympic Plastics Co., Inc.
Peterson & Neville Inc.
Regal Plastic Co.
Skydyne Inc.
TA Mfg. Corp.
Telectro Industries Corp.
C. W. Turk Corp.
United Mfg. Co., The
Waldom Electronics Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.

CASES, PORTABLE

Aerodex, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Calcor Corp., Aircraft Div.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
*COOPER DEVELOPMENT CORP.
*CRAIG SYSTEMS, INC.
C. R. Daniels, Inc.
Ludwig Honold Mfg. Co.
Houston Fearless Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Muckle Mfg. Co.
Multi-Amp Corp.
Olympic Plastics Co., Inc.
Plastic Age Sales, Inc.
Regal Plastic Co.
Schaffer Air Industries, Inc.
Skydyne Inc.
TA Mfg. Corp.
Telectro Industries Corp.
Thompson Products, Inc.
C. W. Turk Corp.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.

CASES, TUBES

Aluminum Co. of America
American Car & Foundry Div., ACF Industries, Inc.
Skydyne Inc.
TA Mfg. Corp.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.

CASTERS

Albion Industries, Inc.
Albert H. Cayne Equipment Corp.
Champion Airquipment Inc.
Fairbanks Co., The
Faultless Caster Corp.
Walter J. Hyatt Co., The
Stewart-Warner Corp.
United Mfg. Co., The
United Supply Co.

CATAPULTS

Basic Tool Industries, Inc.
E. W. Bliss Co.
Clark-Aiken Co., The
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Lukens Steel Co.
Macks Trucks, Inc., Govt. Div.
McCormick Selph Associates
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Opelika Welding, Machine, & Supply Inc.
Pacific Coast Engrg. Co.
Pitman Mfg. Co.
Propellex Chemical Corp.
Reaction Motors, Inc.
Sancor Corp.
Stanley Aviation Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Washington Technological Associates Inc.
Wells Industries Corp.

CEMENT, WOOD

Dennis Chemical Co.
Lebec Chemical Corp.

CHAINS

G. M. Dykes Iron Works, Inc.
Sierra Engrg. Co.
Transue & Williams Steel Forging Corp.

CHAMBERS, IONIZATION

Hamilton Watch Co., Military Products Div.
Pacific Coast Engrg. Co.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Warren Mfg. Div., Warren Brothers Roads Co.

CHAMBERS, SHIELDED SCREEN

Hamilton Watch Co., Military Products Div.
Modglin Co. Inc.
Solar Aircraft Co.
Telectro Industries Corp.

CHAMBERS, TEMPERATURE & HUMIDITY

Aireco, Inc.
American Electronics, Inc.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
Cincinnati Sub Zero Products
Environmental Equipment Co.
G. W. Galloway Co.
Greenbrier Instruments Inc.
Guardite Co., Div. of American-Marietta Co.
Murphy & Miller Inc.
Pacific Coast Engrg. Co.
Resdel Engrg. Corp.
Standard Cabinet Co.
Telectro Industries Corp.
United States Dynamics Corp.
Warren Mfg. Div., Warren Brothers Roads Co.

CHAMBERS, TEST

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
ACF Industries, Inc., Advanced Products Div.
Aireco, Inc.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
Cincinnati Sub Zero Products
J. P. DeVine Mfg. Co.
Environmental Equipment Co.
G. W. Galloway Co.
Greenbrier Instruments Inc.
Guardite Co., Div. of American-Marietta Co.
Hallamore Electronics Co.
Ideal Aerosmith, Inc.
International Aerocoustics Corp.
***KAHN & CO., INC.**
Murphy & Miller Inc.
NRC Equipment Corp.
Pacific Coast Engrg. Co.
Resdel Engrg. Corp.
Telectro Industries Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
Western Arc Welding, Inc.

CHARGERS, BATTERY

Automatic Switch Co.
Christie Electric Corp.
Joe Davidson & Associates
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
General Railway Signal Co.
General Scientific Equipment Co.
Georator Corp.
Green Rectifier Co.
Hammett Electric Co.
Hertner Electric Co., The
Lee Electric & Mfg. Co.
Macarr, Inc.
J. J. Monaghan Co., Inc.
***MOTOR GENERATOR CORP.**
Motoresearch Co.
Multi-Amp Corp.
North Electric Co.
D. W. Onan & Sons Inc.
Precision Apparatus Co., Inc.
Schauer Mfg. Corp.
Sun Electric Corp.
Telectro Industries Corp.
Telkor, Inc.
Westinghouse Electric Corp.
Winder Aircraft Corp. of Fla.

CIRCUITS, PLUG-IN

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Alden Products Co.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Cleveland Metal Specialties Co.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eaton Electronics Corp.
Electronics Corp. of America
Elektro-Serv Co.
Food Machinery & Chemical Corp., Ordnance Div.
General Railway Signal Co.
International Electric Industries, Inc.
International Research Associates
La Pointe Industries Inc.
Lytle Engrg. & Mfg. Co.
Motorola Inc., Military Marketing Div.
NYT Electronics, Inc.
Onondaga Pottery Co., Electronics Div.
Orbitran Co., Inc.
Precision Circuits, Inc.
Printed Electronics Corp.
Reeves Instrument Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
TA Mfg. Corp.
Topper Mfg. Co., Inc.
Walkirt Co.

CLAMPS

Abalon Precision Mfg. Corp.
Aeroquip Corp.
American Brass Co., The
Dumont Aircraft Fitting Co.
Hallett Mfg. Co.
Holub Industries, Inc.
Hunter Spring Co.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Kickhaefer Mfg. Co.
National Utilities Corp.
Specialty Products Corp.
TA Mfg. Corp.
Winder Aircraft Corp. of Fla.

Conduit

Aluminum Co. of America
Dumont Aircraft Fitting Co.
Hallett Mfg. Co.
Holub Industries, Inc.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Kickhaefer Mfg. Co.
Rattan Mfg. Co., The
Servicair Co.
Skytronics
TA Mfg. Corp.
Titeflex, Inc.
Turbo Products, Inc.
Winder Aircraft Corp. of Fla.

Ground

Blaco Mfg. Co.
D. S. D. Mfg. Co., The
Dumont Aircraft Fitting Co.
Joclin Mfg. Co.
Rattan Mfg. Co., The
TA Mfg. Corp.
Titeflex, Inc.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

Harness

Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Capewell Mfg. Co.
Hallett Mfg. Co.
Holub Industries, Inc.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Kickhaefer Mfg. Co.
Servicair Co.
Skytronics
TA Mfg. Corp.
Titeflex, Inc.
United Supply Co.
United-Carr Fastener Corp.
Weckesser Co.
Winder Aircraft Corp. of Fla.

Hose

Aeroquip Corp.
Avica Corp.
Devilbiss Co., The
Dumont Aircraft Fitting Co.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Marman Div., Aeroquip Corp.
Specialty Products Corp.
TA Mfg. Corp.
Titeflex, Inc.
Turbo Products, Inc.
United Supply Co.
United-Carr Fastener Corp.
Winder Aircraft Corp. of Fla.

Mechanical Cable

Aerolite Electronics Corp.
Burndy Corp., Omaton Div.
Holub Industries, Inc.
Walter K. Jaros, Aircrafters
Kickhaefer Mfg. Co.
Kulka Electric Corp.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

CLEANERS, CONTACT

Caig Laboratories
Cobehn, Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Fine Organics, Inc.
General Railway Signal Co.
London Chemical Co., Inc.
McKenna Labs.
Merix Chemical Co.
John B. Moore Corp.
Penetone Co., The
Superex Electronics Corp.
Turco Products, Inc.

CLIPS, BATTERY

Aerolite Electronics Corp.
Birnbach Radio Co., Inc.
Hammett Electric Co.
Heldor Mfg. Co., Inc.
Keystone Electronics Corp.
Mueller Electric Co.
Sittler Corp.
Telectro Industries Corp.
United Supply Co.
Western International Co.
Winder Aircraft Corp. of Fla.

CLIPS, MECHANICAL CABLE

Birnbach Radio Co., Inc.
Heldor Mfg. Co., Inc.
Kickhaefer Mfg. Co.
Progressive Research & Development Co., Inc.
Reliable Spring & Wire Forms Co., The
TA Mfg. Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

CLOTHS, GRILL

Cambridge Wire Cloth Co., The
Flock Process Co. Inc.
Telectro Industries Corp.
Wagner Awning & Mfg. Co., The

CLOTHS, SPEAKER GRILLE

Flock Process Co. Inc.
Peerless Products Industries
Telectro Industries Corp.
Wagner Awning & Mfg. Co., The

CLUTCHES, MOTOR & GENERATOR

American Electronics, Inc.
American Flexible Coupling Div., Zurn Industries, Inc.
Analogue Controls Inc.
Bogue Electric Mfg. Co.
Cutler-Hammer Inc.
Digitronics Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Exact Engrg. & Mfg. Inc.
General Railway Signal Co.
Globe Industries, Inc.
***GRAPHITE METALLIZING CORP.**
Hoover Electric Co.
La Pointe Industries Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Overload Control Co.
Reeves Instrument Corp.
Robot Appliances Inc.
Servomechanisms, Inc., Mechatrol Div.
Sier-Bath Gear & Pump Co., Inc.
Talley Corp., The
Telectro Industries Corp.
Varo Mfg. Co.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Wacline, Inc.

CODE & TAB MARKERS

W. H. Brady Co.
Roovers-Lotson Corp.
Westline Products Div., Western Lithograph Co.

COIL DOPE

Avondale Co., The
Caddell-Burns Mfg. Co. Inc.
Dennis Chemical Co.
General Railway Signal Co.

COIL FORMS

Asociated American Winding Co., Inc.
Caddell-Burns Mfg. Co. Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Diamonite Products Mfg. Co.
Emerson Plastics Corp.
Garde Mfg. Co.
Franklin Fibre-Lamitex Corp.
General Railway Signal Co.
Hamilton Watch Co., Military Products Div.
Hydro Molding Co. Inc.
Isolantite Mfg. Corp.
Molding Corp. of America
National Coil Co.
North Hills Electric Co., Inc.
Peerless Products Industries
Resdel Corp.
Rowe Industries
Sealectric Switch & Relay Corp.
Sinclair Mfg. Co.
D. M. Steward Mfg. Co.
Superex Electronics Corp.

COIL WINDING MACHINES

Asociated American Winding Co., Inc.
Cedar Engrg. Div.-Control Data Corp.
Coil Winding Equipment Co.
Cosa Corp.
Electric Auto-Lite Co., The
Patterson, Moos Div.-Universal Winding Co., Inc.

COILS, HEATING

Acme Electric Heating Co.
Advanced Electronics, Inc.
Associated American Winding Co., Inc.
Bell & Gossett Co.
Cutler-Hammer Inc.
Wilbur B. Driver Co.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
J. J. Monaghan Co., Inc.
Precision, Inc.
***RYAN INDUSTRIES**
Telectro Industries Corp.

COILS, SPEAKER

Aerolite Electronics Corp.
Asociated American Winding Co., Inc.
Electronic Transformer Co., Inc.
Feiler Engrg. & Mfg. Co.
Magnavox Co., The
J. J. Monaghan Co., Inc.
Telectro Industries Corp.
Waldom Electronics Inc.
Wright Zimmerman, Inc.

COMMUNICATIONS SYSTEMS, COMMERCIAL

Amelco, Inc.
American Printed Circuits Co., Inc.
Alfred W. Barber Labs.
Bliss Electronic Corp.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
Centronix Inc.
Communications Co.
Executone, Inc.
Feiler Engrg. & Mfg. Co.
General Railway Signal Co.
Hallamore Electronics Co.
International Research Associates
Lenkurt Electric Co., Inc.
Motorola Inc., Military Marketing Div.
North Electric Co.
Northeast Electronics Corp.
Philco Corp., Government & Industrial Divs.
Prodelin Inc.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Talk-A-Phone Co.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Victor Electric Wire & Cable Corp.
Western Electro-Acoustic Lab.
Wunderlich Radio Co.

COMMUNICATIONS SYSTEMS, INTERCOM

American Research & Mfg. Corp.
Bliss Electronic Corp.
Centronix Inc.
Dwyer Engrg. Co., Inc.
Elm Mfg. Co. Inc.
Executone, Inc.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Hallamore Electronics Co.
Lane Electronics Mfg. Corp.
Motorola Inc., Military Marketing Div.
North Electric Co.
Northeast Electronics Corp.
Philco Corp., Government & Industrial Divs.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Talk-A-Phone Co.
Telectro Industries Corp.
Terminal Radio Corp.
Victor Electric Wire & Cable Corp.
Western Electro-Acoustic Lab.

COMPOUNDS, CLEANING

Auburn Spark Plug Co., Inc.
Avondale Co., The
George Basch Co., The
Calcor Corp., Aircraft Div.
Solar Aircraft Co.
Turco Products, Inc.
Wye Industries

COMPRESSORS, AIR

Accessory Controls & Equipment Corp.
Air Logistics Corp.
Air Products, Inc.
American Brake Shoe Co.
Calcor Corp., Aircraft Div.
Cardox Corp.
Cooper-Bessemer Corp., The
***CORNELIUS CO., THE**
Devilbiss Co., The
***EASTERN INDUSTRIES, INC.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Gardner-Denver Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Gray Co., Inc.
Haskell Engrg. & Supply Co.
Joy Mfg. Co.
***KAHN & CO., INC.**
Walter Kidde & Co., Inc., Aviation Div.
Lear, Inc.
Nash Engrg. Co., The
Pennsylvania Pump & Compressor Co.
Quincy Compressor Co.
Solar Aircraft Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Superior Pneumatic & Mfg., Inc.
Thompson Products, Inc.
United Mfg. Co. Div., The W. L. Maxson Corp.
Wayne Pump Co., The
***WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.**

COMPRESSOR ASSEMBLIES, MOBILE

Accessory Controls & Equipment Corp.
Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
American Brake Shoe Co.
Cal-Air Conditioning Co.
Cardox Corp.
Continental Aviation & Engrg. Corp.
***COOPER DEVELOPMENT CORP.**
***CORNELIUS CO., THE**
Devilbiss Co., The
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Joy Mfg. Co.
Walter Kidde & Co., Inc., Aviation Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Stearns-Roger Mfg. Co.
Thompson Products, Inc.
Twix Mfg. Co., Inc.
Wells Industries Corp.

CONDUITS, ELECTRIC

Aluminum Co. of America
American Brass Co., American Metal Hose Div.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
General Cable Corp.
Hallett Mfg. Co.
Rome Cable Corp.
Zippertubing Co., The

CONNECTORS, HIGH VOLTAGE

Aerolite Electronics Corp.
Airwork Corp.
Alden Products Co.
***ANTON ELECTRONIC LABS., INC.**
Auburn Spark Plug Co., Inc.
Avnet Corp.
Burndy Corp., Omaton Div.
Cal-Ohm Labs. Inc.
Cannon Electric Co.
Coaxial Connector Co. Inc.
Dejur-Amsco Corp.
R. C. Dudek & Co.
Elco Corp.
Garde Mfg. Co.
General R-F Fittings, Inc.
Hammett Electric Co.
Hobson Brothers Inc.
E. F. Johnson Co.
Joy Mfg. Co.
Molding Corp. of America
Scintilla Div., Bendix Aviation Corp.
Servicair Co.
Telectro Industries Corp.
U.S. Component Inc.
Western International Co.
Winchester Electronics, Inc.

CONNECTORS, MICROPHONE

Aerolite Electronics Corp.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Cal-Ohm Labs., Inc.
Cannon Electric Co.
Coaxial Connector Co. Inc.
Connector Corp.
Dialight Corp.
Elco Corp.
General R-F Fittings, Inc.
Howard B. Jones Div.-Cinch Mfg. Corp.
Richards Electrocraft, Inc.
Telectro Industries Corp.
Victor Electric Wire & Cable Corp.
Western International Co.

CONNECTORS, POWER

Airwork Corp.
***ANTON ELECTRONIC LABS., INC.**
***AUTOMATIC & PRECISION MFG. CO.**
Avnet Corp.
Burndy Corp., Omaton Div.
Cal-Ohm Labs., Inc.
Cannon Electric Co.
Coaxial Connector Co. Inc.
Dejur-Amsco Corp.
Elco Corp.
Garde Mfg. Co.
General R-F Fittings, Inc.
Joclin Mfg. Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Joy Mfg. Co.
Kulka Electric Corp.
***HAROLD H. POWELL CO.**
Pyle-National Co., The
Royal Electric Corp.
Scintilla Div., Bendix Aviation Corp.
Titeflex, Inc.
U.S. Component Inc.
Western International Co.
Winchester Electronics, Inc.

CONNECTORS, SKID AND SLED

Burndy Corp., Omaton Div.
Cannon Electric Co.
Capewell Mfg. Co.
Elco Corp.
General R-F Fittings, Inc.
Thompson Products, Inc.
Winchester Electronics, Inc.

CONSOLES, AUDIO

American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Antlab Inc.
Basic Tool Industries, Inc.
Calcor Corp., Aircraft Div.
Dunlap Electronics, Inc.
Electromation Co.
Falstrom Co.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
General Railway Signal Co.
Kinevox-Hallen
Lane Electronics Mfg. Corp.
Motorola Inc., Military Marketing Div.
Peterson & Neville Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**

CONSOLES, LIGHTING CONTROL

***AMERICAN MACHINE & FOUNDRY CO.**
American Research & Mfg. Corp.
Calcor Corp., Aircraft Div.
Falstrom Co.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
General Railway Signal Co.
Kilgen Aircraft Div.-The Kilgen Organ Co.
Peterson & Neville Inc.
Schaffer Air Industries, Inc.
Telectro Industries Corp.

CONTAINERS

Liquified Gas, Liquid Helium, Liquid Hydrogen, Liquid Oxygen
***HOFMAN LABS., INC.**

CONTROLLERS, REMOTE SOUND

General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Telectro Industries Corp.
Varo Mfg. Co.

CONTROLS

Air Speed Tool Co.
Barton Instrument Corp.
Cutler-Hammer Inc.
Daven Co., The
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
***A. W. HAYDON CO., THE**
Industrial Electronic Engineers
***KAHN & CO., INC.**
Lane Electronics Mfg. Corp.
Librascope Inc.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

Register Cutter

Clark-Aiken Co., The
Electric Eye Equipment Co.
Intercontinental Dynamics Corp.
Skiatron Electronics & Television Corp.

Sound System

Air Logistics Corp.
Hallamore Electronics Co.
Lane Electronics Mfg. Corp.
P. R. Mallory & Co. Inc.
J. A. Maurer, Inc.
Motorola Inc., Military Marketing Div.
North Electric Co.
Telectro Industries Corp.
Victor Electric Wire & Cable Corp.
Western Electro-Acoustic Lab.

Specific Gravity

Brooks Rotameter Co.
CDC Control Services, Inc.
Fischer & Porter Co.
Hagan Chemicals & Controls, Inc.
Hallikainen Instruments
Liquidometer Corp., The
Nuclear Corp. of America, Inc.

Ventilating Control System

Cal-Air Conditioning Co.

. . . ground support

Cutler-Hammer Inc.
Henry G. Dietz Co., Inc., The
Fenwal Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Scientific Instrument Co.
Southwestern Industrial Electronics Co.
Thompson Products, Inc.
Vap-Air Div., Vapor Heating Corp.

Volume

Air Speed Tool Co.
Carleton Aviation Co., Inc.
Daven Co., The
Dunlap Electronics, Inc.
P. R. Mallory & Co. Inc.
Simmonds Aerocessories, Inc.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

Volume & Tone

Daven Co., The
Dunlap Electronics, Inc.
P. R. Mallory & Co. Inc.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.

Weight

Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
CDC Control Services, Inc.
Dynametrics Corp.
Gilmore Industries Inc.
Hoover Electronics Co.
Industrial Electronic Engineers
Telectro Industries Corp.

Welding

Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Eisler Engrg. Co., Inc.
General Electric Co., Apparatus Sales Div.
***KAHN & CO., INC.**
Modglin Co. Inc.
Taylor-Winfield Corp., The
Vacuum Tube Products Co. Inc.

CONVEYORS

American Conveyor Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Basic Tool Industries, Inc.
Chain Belt Co.
Cleveland Crane & Engrg. Co., The
G. M. Dykes Iron Works, Inc.
Fairfield Engrg. Co., The
Food Machinery & Chemical Corp., Ordnance Div.
Hewitt-Robins, Inc.
Joy Mfg. Co.
Magline Inc.
R. C. Mahon Co., The
Modglin Co. Inc.
Sage Equipment Co. Inc.
Stearns-Roger Mfg. Co.
A. T. Stevens Co.
Warren Mfg. Div., Warren Brothers Roads Co.

COOKERS, ELECTRONIC

Telectro Industries Corp.

CORDS

American Super-Temperature Wires, Inc.
Belden Mfg. Co.
International Electric Industries, Inc.
Telectro Industries Corp.
Victor Electric Wire & Cable Corp.

Attachment

Accurate Insulated Wire Corp.
American Super-Temperature Wires, Inc.
Belden Mfg. Co.
International Electric Industries, Inc.
Royal Electric Corp.
Telectro Industries Corp.
Victor Electric Wire & Cable Corp.

Dial

Gudebrod Bros. Silk Co., Inc.
International Electric Industries, Inc.
New England Electrical Works, Inc.
Telectro Industries Corp.

Dial Cords & Cables

Alpha Wire Corp.
Birnbach Radio Co., Inc.
Gudebrod Bros. Silk Co., Inc.
New England Electrical Works, Inc.
Rex Corp., The

Lacing

Alpha Wire Corp.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
Columbia Rope Co.
C. R. Daniels, Inc.
Gudebrod Bros. Silk Co., Inc.
International Electric Industries, Inc.
Organic Development Corp., Spectra-Strip Div.
Security Parachute Co.
Waldom Electronics Inc.

Line

Accurate Insulated Wire Corp.
Alden Systems Co.
Alpha Wire Corp.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
International Electric Industries, Inc.
Royal Electric Corp.
Telectro Industries Corp.
Victor Electric Wire & Cable Corp.

Line Resistance

American Electric Cable Co.
Birnbach Radio Co., Inc.
Victor Electric Wire & Cable Corp.

COUPLINGS

Accurate Electronics Corp., Dept. D
Aeroquip Corp.
Amatom Electronic Hardware Co. Inc.
Anchor Coupling Co. Inc.
Arkwin Industries, Inc.
Bridgwater Machine Co.
***BUCKEYE IRON & BRASS WORKS**
Chain Belt Co.
***COOPER DEVELOPMENT CORP.**
Dial Products Co.
Dodge Mfg. Corp.
Dumont Aircraft Fitting Co.
Dumont Aviation Associates
Essex Mfg. Co., Inc.
Foote Brothers Gear & Machine Corp.
Futurecraft Corp.
General Components Inc.
Harman Equipment Co.
Hewitt-Robins, Inc.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Herrick L. Johnston, Inc.
Koppers Co., Inc.
Lovejoy Flexible Coupling Co.
Metron Instrument Co.
National Utilities Corp.
Ozone Metal Products Corp.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Philadelphia Gear Works, Inc.
Pneu-Hydro Valve Corp.
Pyles Industries, Inc.
Reeves Instrument Corp.
Renbrandt, Inc.
Resistoflex Corp.
Sier-Bath Gear & Pump Co., Inc.
Snap-Tite, Inc.
Specialty Products Corp.
Stratoflex, Inc.
Telectro Industries Corp.
Thompson Products, Inc.
Titeflex, Inc.
Turbo Products, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
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E. B. Wiggins Oil Tool Co. Inc.

Quick disconnect

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Austin-Western, Construction Equip. Div.-Baldwin-Lima-Hamilton Corp.
Albert H. Cayne Equipment Corp.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.
Cleveland Crane & Engrg. Co., The
Coles Cranes, Inc.
Conco Engrg. Works
Detroit Hoist & Machine Co.
Food Machinery & Chemical Corp., Ordnance Div.
R. C. Mahon Co., The
McDowell Co. Inc.
Modglin Co. Inc.
Pacific Coast Engrg. Co.
Pitman Mfg. Co.
Stearns-Roger Mfg. Co.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

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Eidson Electronic Co.
Hunt Corp., The
James Knights Co., The
Midland Mfg. Co., Inc.
August E. Miller Laboratories
Monitor Products Co.
Premier Research Laboratories, Inc.
Reeves-Hoffman Div.
United States Dynamics Corp.

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P. R. Hoffman Co.
James Knights Co., The
McCoy Electronics Co.
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Veeco Vacuum Corp.

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Cox & Co., Inc.
Electrofilm, Inc.
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James Knights Co., The
Monitor Products Co.
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Techniques, Inc.
United States Dynamics Corp.

Ovens

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Bliley Electric Co.
Bulova Watch Co., Electronics Div.
Clark Crystal Co.
Cox & Co., Inc.
J. P. DeVine Mfg. Co.
Elm Mfg. Co. Inc.
Hunt Corp., The
Herrick L. Johnston, Inc.
James Knights Co., The
Lavoie Labs., Inc.
Manson Laboratories, Inc.
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Monitor Products Co.
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Bulova Watch Co., Electronics Div.
Lindberg Engrg. Co.
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Hammett Electric Co.
Hunt Corp., The
Hycon Eastern Inc.
International Crystal Mfg. Co. Inc.
James Knights Co., The
Lenkurt Electric Co., Inc.
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Midland Mfg. Co., Inc.
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Monitor Products Co.
Motorola Inc., Military Marketing Div.
Premier Research Laboratories, Inc.
Reeves-Hoffman Div.
Terminal Radio Corp.
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Diamond Drill Carbon Co., The
P. R. Hoffman Co.
August E. Miller Laboratories
Motorola Inc., Military Marketing Div.
Norton Co.
Philco Corp., Government & Industrial Divs.
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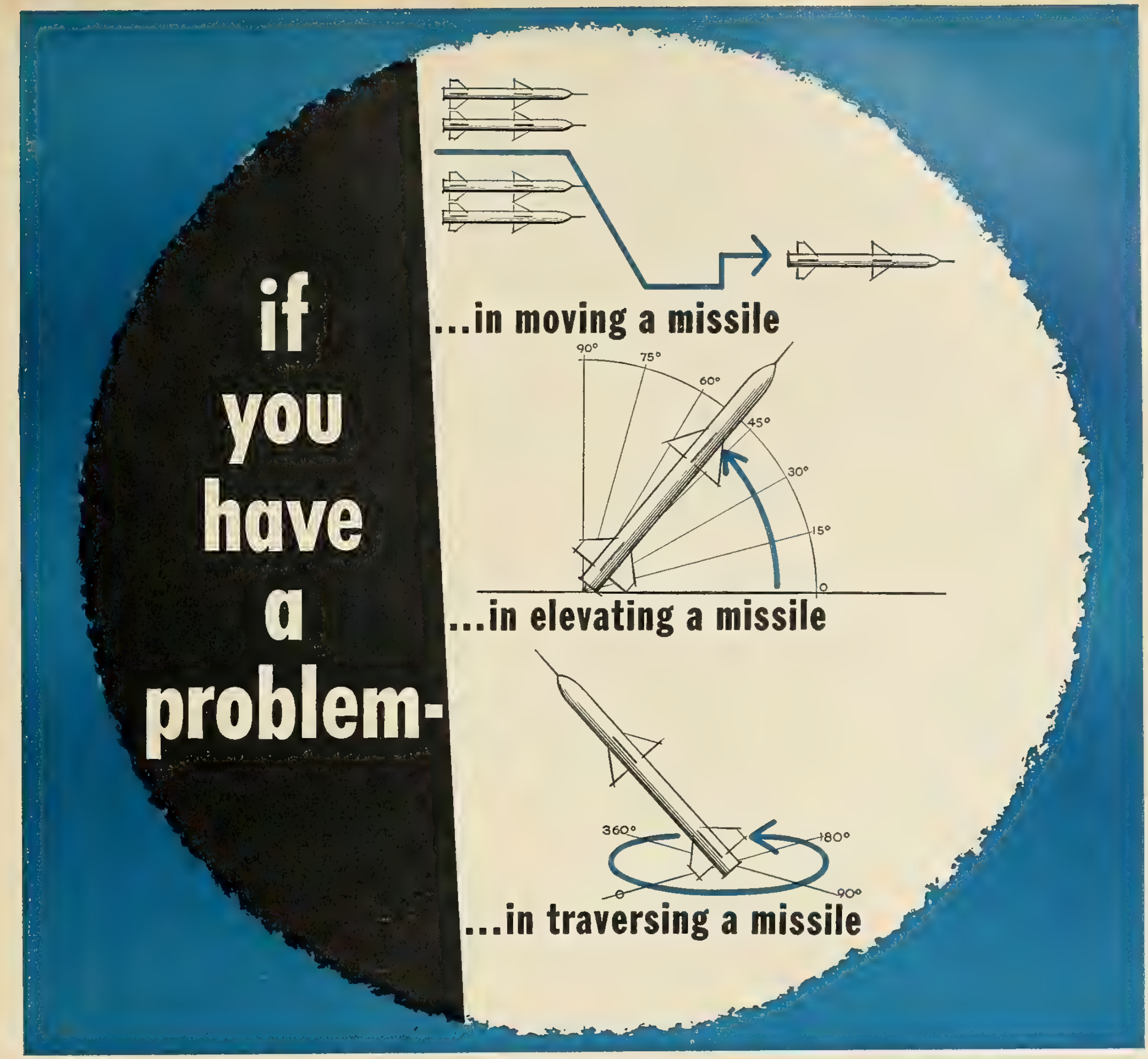

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General Scientific Equipment Co.
Hoffman Electronics Corp., Semiconductor Div.
Walter Kidde & Co., Inc., Aviation Div.

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General Electric Co., Apparatus Sales Div.
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Peerless Photo Products Inc.

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Wacline, Inc.

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General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Western International Co.

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Merz Engrg., Inc.
Muckle Mfg. Co.
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Opelika Welding, Machine, & Supply Inc.
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United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
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Wheland Co., The
Wickfield, Inc.
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Aircraft Standards, Inc.
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Bland Burner Co., The
Danly Machine Specialties, Inc.
Emerson Plastics Corp.
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Size Control Co.
Warren Mfg. Div., Warren Brothers Roads Co.

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John Griffin Co.
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Clausing Div.-Atlas Press Co.
Graflex, Inc.

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Wales Strippit Co., Unit of Houdaille Industries, Inc.

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Dremel Mfg. Co.
Hammett Electric Co.
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.

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Electro-Tech Equipment Co.
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Miskella Infra-Red Co., The
Norton Co.
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Telectro Industries Corp.
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.
Waage Electric, Inc.
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***WESTINGHOUSE ELECTRIC CORP.**

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Electrofilm, Inc.
Elm Mfg. Co. Inc.
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***RYAN INDUSTRIES**
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CDC Control Services, Inc.
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***HARTMAN ELECTRICAL MFG. CO., THE**
***KAHN & CO., INC.**
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Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Propellex Chemical Corp.
Vickers Inc., Div.-Sperry Rand
Wells Industries Corp.

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Guardite Co., Div. of American-Marietta Co.
Hallamore Electronics Co.
Haskell Engrg. & Supply Co.
International Aerocoustics Corp.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Marquardt Aircraft Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Murphy & Miller Inc.
NRC Equipment Corp.
***RYAN INDUSTRIES**
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Standard Cabinet Co.
Telectro Industries Corp.
Tenney Engrg., Inc.
Thompson Products, Inc.
Trop-Arctic, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Washington Technological Associates Inc.

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American Brass Co., American Metal Hose Div.
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Basic Tool Industries, Inc.
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***COOPER DEVELOPMENT CORP.**
Cromer Mfg. & Engrg., Inc.
***DIVERSEY ENGRG. CO.**
Eaton Mfg. Co., Inc., Fredric Flader Div.
Flexaust Co., The
General Sound Control, Inc.
International Aerocoustics Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Henry & Miller Industries, Inc.
Modglin Co. Inc.
Parish Pressed Steel, Div.-Dana Corp.
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
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Thieblot Aviation Co., Div.-Vitro Corp. of America
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Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

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Bridgwater Machine Co.
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Eaton Mfg. Co., Inc., Fredric Flader Div.
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Ludwig Honold Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
***LYCOMING DIV., AVCO MFG. CORP.**
Henry & Miller Industries, Inc.
Modglin Co. Inc.
Parish Pressed Steel, Div.-Dana Corp.
Penn-Michigan Mfg. Corp.
***PHOENIX PRODUCTS CO.**
Portland Copper & Tank Works Inc.
Quick Charge Corp.
Ryan Aeronautical Co.
Silicone Insulation, Inc.
Smith-Morris Corp.
Solar Aircraft Co.
Thieblot Aviation Co., Div.-Vitro Corp. of America
***C. W. TORNGREN CO., INC.**
Turbo Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wright Aeronautical Div., Curtiss-Wright Corp.

EXHAUST DUCTS

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American Aerophysics Corp.
American Brass Co., American Metal Hose Div.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Associated Co., Inc.
Basic Tool Industries, Inc.
Cal-Air Conditioning Co.
Cromer Mfg. & Engrg., Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Flexaust Co., The
Ludwig Honold Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
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Penn-Michigan Mfg. Corp.
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***UNITED AIRCRAFT PRODUCTS, INC.**
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EXHAUST HEAT EXCHANGERS

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Modglin Co. Inc.
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Thieblot Aviation Co., Div.-Vitro Corp. of America
***UNITED AIRCRAFT PRODUCTS, INC.**

EXHAUST MUFFS

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Fram Corp.
General Sound Control, Inc.
Hastings Plastics Inc.
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FILTERS

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Automatic Switch Co.
Bendix Aviation Corp., Skinner-Poroloy Div.
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Commercial Filters Corp.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
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Fram Corp.
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Harman Equipment Co.
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Permanent Filter Corp.
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Telectro Industries Corp.
United Transformer Corp.
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***WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.**
Winder Aircraft Corp. of Fla.

Air

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Aero Supply Mfg. Co., Inc.
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Air-Maze Corp.
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Amplex Div.-Chrysler Corp.
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Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Cardox Corp.
Commercial Filters Corp.
Coppus Engrg. Corp.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
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Turbo Products, Inc.
Wells Industries Corp.
***WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.**
Winder Aircraft Corp. of Fla.
Winslow Aerofilter Corp.

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Aeroproducts Operations, Allison Div., General Motors Corp.
Aircraft Porous Media, Inc.
Air-Maze Corp.
Amplex Div.-Chrysler Corp.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Commercial Filters Corp.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
Fram Corp.
General Cable Corp.
General Filters, Inc.
***GREER HYDRAULICS, INC.**
Harman Equipment Co.
Hastings Plastics Inc.
Walter J. Hyatt Co., The
Imperial Brass Mfg. Co., The
Herrick L. Johnston, Inc.
***KAHN & CO., INC.**
Koehler Aircraft Products Co., Inc.
Marvel Engrg. Co.
Michigan Wire Cloth Co.
National Airoil Burner Co.
Ozone Metal Products Corp.
Permanent Filter Corp.
Pneu-Hydro Valve Corp.
Poroloy Equipment, Inc.
St. Marys Carbon Co.
William W. Stanley Co. Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
Warner Lewis Co., Div.-Fram Corp.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.
Winslow Aerofilter Corp.

Hydraulic

Aero Supply Mfg. Co., Inc.
Aircraft Porous Media, Inc.
Air-Maze Corp.
Auto-Control Labs., Inc.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Commercial Filters Corp.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
Futurecraft Corp.
General Cable Corp.
General Filters, Inc.
***GREER HYDRAULICS, INC.**
Harman Equipment Co.
Hastings Plastics Inc.
Walter J. Hyatt Co., The
Marvel Engrg. Co.
Ozone Metal Products Corp.
Permanent Filter Corp.
Pneu-Hydro Valve Corp.
Poroloy Equipment, Inc.
Sun Electric Corp.
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Wells Industries Corp.
Winder Aircraft Corp. of Fla.
Winslow Aerofilter Corp.

Mechanical

Aero Supply Mfg. Co., Inc.
Aircraft Porous Media, Inc.

Air-Maze Corp.
Bendix Aviation Corp., Skinner-Poroloy Div.
Briggs Filtration Co., The
Cardox Corp.
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
General Cable Corp.
Harman Equipment Co.
***KAHN & CO., INC.**
Marvel Engrg. Co.
Poroloy Equipment, Inc.
Robbins Aviation, Inc.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

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Air-Maze Corp.
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Canoga Corp. of California
Electronic Transformer Co., Inc.
McCoy Electronics Co.
Motorola Inc., Military Marketing Div.
National Coil Co.
Potter Co., The
Ram Electronics Inc.
Saratoga Industries
Telectro Industries Corp.
Tobe Deutschmann Corp.
United Transformer Corp.
Winder Aircraft Corp. of Fla.

Radio Tower Lighting

E. F. Johnson Co.
Kopp Glass, Inc.
Telectro Industries Corp.
Tobe Deutschmann Corp.
United Transformer Corp.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

FINDERS, RANGE

***BAUSCH & LOMB OPTICAL CO.**
Buhl Optical Co.
Cubic Corp.
Davidson Mfg. Co.
Eastman Kodak Co.
Graflex, Inc.
Hamilton Watch Co., Military Products Div.
***HAYWARD SCIENTIFIC GLASS CORP.**
La Pointe Industries Inc.
J. A. Maurer, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Wollensak Optical Co.

FINDERS, VIEW

Aeroflex Corp., The, Aeroflex Labs. Div.
***BAUSCH & LOMB OPTICAL CO.**
Buhl Optical Co.
Davidson Mfg. Co.
Eastman Kodak Co.
Graflex, Inc.
Hamilton Watch Co., Military Products Div.
***HAYWARD SCIENTIFIC GLASS CORP.**
La Pointe Industries Inc.
J. A. Maurer, Inc.
Telectro Industries Corp.
Wollensak Optical Co.

FIRE ALARM SYSTEMS

Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Fenwal Inc.
Globe Automatic Sprinkler Co.
Walter Kidde & Co., Inc., Aviation Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Piezo Products Co.
Propellex Chemical Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Vap-Air Div., Vapor Heating Corp.
Victor Electric Wire & Cable Corp.

FIRE DETECTORS

American La France Corp.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electron-Radar Products
Fenwal Inc.
Globe Automatic Sprinkler Co.
Hoffman Electronics Corp., Semiconductor Div.
Iron Fireman Mfg. Co., Electronics Div.
Walter Kidde & Co., Inc., Aviation Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Piezo Products Co.
Telectro Industries Corp.
Vap-Air Div., Vapor Heating Corp.
Wilcolator Co., The

FIRE EXTINGUISHING SYSTEMS

Akron Brass Mfg. Co., Inc.
Ansul Chemical Co.
Callery Chemical Co.
Cardox Corp.
Fenwal Inc.
Food Machinery & Chemical Corp., Ordnance Div.
General Fire Extinguisher Corp., The
Globe Automatic Sprinkler Co.
Walter Kidde & Co., Inc., Aviation Div.
National Foam System, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Propellex Chemical Corp.
M. L. Snyder & Son, Inc.

FIRE PROTECTION SYSTEMS

Akron Brass Mfg. Co., Inc.
American La France Corp.
Cardox Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Fenwal Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Four Wheel Drive Auto Co., The
General Fire Extinguisher Corp., The
Globe Automatic Sprinkler Co.
Walter Kidde & Co., Inc., Aviation Div.
National Foam System, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
M. L. Snyder & Son, Inc.

FIRE STANDS, MISSILE

ACF Industries, Inc., Advanced Products Div.
Basic Tool Industries, Inc.
Champion Airquipment Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
G. M. Dykes Iron Works, Inc.
Dynametrics Corp.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
Hallamore Electronics Co.
Kaiser Aircraft & Electronics Div.—Kaiser Industries, Corp.
Kaiser Steel Corp., Fabricating Div.
Luria Engrg. Co.
Nuclear Products-Erco, Div.—ACF Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Philips & Davies Inc.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
Washington Technological Associates Inc.
Wells Industries Corp.
Wheland Co., The

FIRING STAND ACCESSORIES

ACF Industries, Inc., Advanced Products Div.
Consolidated Diesel Electric Corp., Test Equip. Div.
***DIVERSEY ENGRG. CO.**
G. M. Dykes Iron Works, Inc.
First Electronics Corp., The
Food Machinery & Chemical Corp., Ordnance Div.
Luria Engrg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Stanley Aviation Corp.
Telectro Industries Corp.
United Mfg. Co., The
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
***WASHINGTON ALUMINUM CO., INC.**
Washington Technological Associates Inc.
Wells Industries Corp.
Wheland Co., The
Wickes Engrg. & Construction Co. Inc.

FUEL HANDLING EQUIPMENT

ACF Industries, Inc., Advanced Products Div.
Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
American Brass Co., American Metal Hose Div.
***AMERICAN MACHINE & FOUNDRY CO.**
***BUCKEYE IRON & BRASS WORKS**
Butler Mfg. Co.
Champion Airquipment Inc.
Chiksan Co.
Consolidated American Services, Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
Consolidated Electrodynamics Corp., Rochester Div.
***COOPER DEVELOPMENT CORP.**
Dynametrics Corp.
Food Machinery & Chemical Corp., Ordnance Div.
Four Wheel Drive Auto Co., The
***FRUEHAUF TRAILER CO.**
G. W. Galloway Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Harman Equipment Co.
Joclin Mfg. Co.
Herrick L. Johnston, Inc.
Kaiser Steel Corp., Fabricating Div.
Marquardt Aircraft Co.
Macks Trucks, Inc., Govt. Div.
A. Y. McDonald Mfg. Co.
National Airoil Burner Co.
Permanent Filter Corp.
Philips & Davies Inc.
Portland Copper & Tank Works Inc.
Reaction Motors, Inc.
Stearns-Roger Mfg. Co.
Vickers Inc., Div.-Sperry Rand
***WASHINGTON ALUMINUM CO., INC.**
Washington Technological Associates Inc.
Wells Industries Corp.
***WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.**

FURNACES

Auto-Control Labs., Inc.
G. W. Galloway Co.
General Electric Co., Apparatus Sales Div.
Grieve-Hendry Co., Inc.
Guardite Co., Div. of American-Marietta Co.
C. I. Hayes, Inc.
A. F. Holden Co., The
K. H. Huppert Co.
***JANITROL AIRCRAFT DIV.—SURFACE COMBUSTION CORP.**
Herrick L. Johnston, Inc.
Leeds & Northrup Co.
Litton Engrg. Labs.
NRC Equipment Corp.
National Airoil Burner Co.
Papesch & Kolstad, Inc.
Selas Corp. of America
Siebring Mfg. Co.
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**

GAS GENERATING DEVICES

Air Products, Inc.
Beckman & Whitley, Inc., Missile Products Div.
G. M. Dykes Iron Works, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Food Machinery & Chemical Corp., Ordnance Div.
***GRAND CENTRAL ROCKET CO.**
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
C. I. Hayes, Inc.
***JANITROL AIRCRAFT DIV.—SURFACE COMBUSTION CORP.**
Herrick L. Johnston, Inc.
McCormick Selph Associates
McDowell Co. Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Papesch & Kolstad, Inc.
Propellex Chemical Corp.
Reaction Motors, Inc.
Ryan Aeronautical Co.
Superior Air Products Co.
Talco Engrg. Co., The
Thompson Products, Inc.
Winchester-West. Div.—Olin Mathieson Chem. Corp.

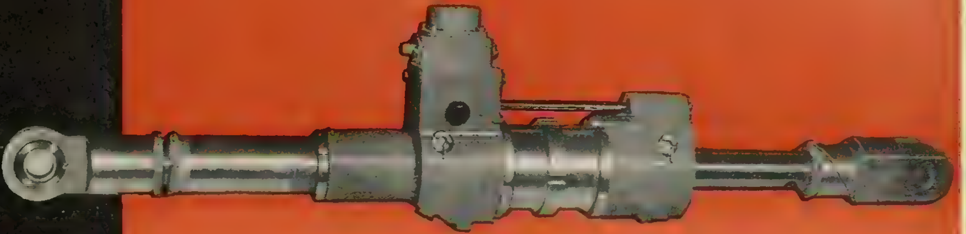
GASES, RARE

Air Products, Inc.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Globe Industries, Inc.
Puritan Compressed Gas Corp., Aviation Div.

GEAR ASSEMBLIES REDUCTION

Acme Gear Co., Inc.
***ADVANCE GEAR & MACHINE CORP.**
Airborne Accessories Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Antlab Inc.
Arch Gear Works Inc.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Bowmar Instrument Corp.
Camdale Corp.
Clark Equipment Co.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Joe Davidson & Associates
Daystrom Instrument Div., Daystrom, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Exact Engrg. & Mfg. Inc.
Foote Brothers Gear & Machine Corp.
Geartronics Corp.
Grant Gear Works, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hewitt-Robins, Inc.
Hoover Electric Co.
Hupp Aviation Co.
Insco Co., Div.-Barry Controls Inc.
Instru-Lec Corp.
Kelsey-Hayes Co.
Librascope Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Macks Trucks, Inc., Govt. Div.
J. A. Maurer, Inc.
Mechanical Div.-General Mills, Inc.
O & M Machine Co., Inc.
Pic Design Corp., Sub—Benrus Watch Co., Inc.
Philadelphia Gear Works, Inc.
Rae Motor Corp.

new Electrol HYDRAULIC ACTUATORS for missile applications



The Electrol Model SK-684 cushion-type hydraulic actuator was designed primarily to control the flight path of America's great, new missiles. It conforms to MIL-C-5503 and MIL-H-5440 and contains a built-in potentiometer which generates a feed-back signal for the amplifier, serving to identify piston position and complete the electrical servo loop. Potentiometer and piston move in unison. Design modifications permit variations in both power output and control methods.

deliver a power output of many tons

Specifications for a Typical Electrol Missile Actuator — Model SK-684

Type	Hydraulic; double acting, cushioned at both ends.
Operating pressure	3,000 p.s.i.
Power output	9,430 lbs.
Ambient temperature range	—65° to +275° f.
Cylinder bore	2.25″
Cylinder rod	1.25″
Cylinder stroke	6.25″
Length (overall)	31.37″
Diameter	3.25″
Mounting	Clevis type
Weight	23 lbs.

Better Designed Products Use Electrol Hydraulics and Pneumatics

Electrol
INCORPORATED
KINGSTON, NEW YORK
HYDRAULICS and PNEUMATICS

VALVES • ACTUATORS • POWER CYLINDERS
HAND PUMPS • POWERPAKS • ACCUMULATORS
LANDING GEAR and SPECIAL EQUIPMENT

Reeves Appliances Inc.
Robot Appliances Inc.
Sesco Mfg., Inc.
Sier-Bath Gear & Pump Co., Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Technical Oil Tool Corp.
Thompson Products, Inc.
***U. S. GEAR CORP.**
Vinco Corp.
Waldom Electronics Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Zagora Gears, Inc.

GEARS, POWDERED METAL

Amplex Div.-Chrysler Corp.
Eaton Mfg. Co.
Globe Industries, Inc.
Keystone Carbon Co.
Licon & Spiroid Divs., Illinois Tool Works
Philadelphia Gear Works, Inc.
St. Marys Carbon Co.
Sier-Bath Gear & Pump Co., Inc.
Stewart-Warner Corp.
Superior Carbon Products, Inc.
Wunderlich Radio Co.
Zagora Gears, Inc.

GEARS, PRECISION

Acme Gear Co., Inc.
***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
***ADVANCE GEAR & MACHINE CORP.**
Allied Plastics Supply Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Arch Gear Works Inc.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Autonetics, Div.-North American Aviation, Inc.
Bergen Carbide Co.
Bowmar Instrument Corp.
Camdale Corp.
Clark Equipment Co.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Daystrom Instrument Div., Daystrom, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Exact Engrg. & Mfg. Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
Foote Brothers Gear & Machine Corp.
Geartronics Corp.
General Controls Co.
General Railway Signal Co.
Globe Industries, Inc.
Grant Gear Works, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hupp Aviation Co.
Instru-Lec Corp.
Invo Spline, Inc.
Kelsey-Hayes Co.
H. Koch & Sons
***LAVEZZI MACHINE WORKS**
Librascope Inc.
Licon & Spiroid Divs., Illinois Tool Works
Link Aviation, Inc.
***LYCOMING DIV., AVCO MFG. CORP.**
Lyndon Aircraft, Inc.
J. A. Maurer, Inc.
Mechanical Div.-General Mills, Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Philadelphia Gear Works, Inc.
Reeves Instrument Corp.
Research Development Mfg. Inc.
Servomechanisms, Inc., Mechatrol Div.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.
Sier-Bath Gear & Pumb Co., Inc.
Stearns-Roger Mfg. Co.
Herman D. Steel Co.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Talley Corp., The
Technical Oil Tool Corp.
Thompson Products, Inc.
***U. S. GEAR CORP.**
Vinco Corp.
Waldom Electronics Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wunderlich Radio Co.
Zagora Gears, Inc.

GEARS, RADIO AND INSTRUMENT

Acme Gear Co., Inc.
Arch Gear Works Inc.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Bowmar Instrument Corp.
Camdale Corp.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Daystrom Instrument Div., Daystrom, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Exact Engrg. & Mfg. Inc.
Geartronics Corp.
Grant Gear Works, Inc.
H. Koch & Sons
***LAVEZZI MACHINE WORKS**
Librascope Inc.
Licon & Spiroid Divs., Illinois Tool Works
Link Aviation, Inc.
Lyndon Aircraft, Inc.
Mechanical Div.-General Mills, Inc.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Philadelphia Gear Works, Inc.
Reeves Instrument Corp.
Research Development Mfg. Inc.
Sier-Bath Gear & Pump Co., Inc.
Technical Oil Tool Corp.
***U. S. GEAR CORP.**
Waldom Electronics Inc.
Wilmar Mfg. Co., Inc.
Wunderlich Radio Co.
Zagora Gears, Inc.

GENERATORS

Louis Allis Co., The
Alto Scientific Co., Inc.
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Welding & Mfg. Co., The
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Collins Engrg. Corp.
Eicor Div.—F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Indicator Co. Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gray & Huleguard, Inc.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hertner Electric Co., The
Instruments Corp., The
***INTERELECTRONICS CORP.**
Jack & Heintz, Inc.
Kurz & Root Co.
Leach Corp.
McKenna Labs.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
***MOTOR GENERATOR CORP.**
Northwestern Electric Co.
D. W. Onan & Sons Inc.
Resdel Engrg. Corp.
Milton Roy Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Talley Corp., The
Task Corp.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.

Electric A. C.

Air Logistics Corp.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Louis Allis Co., The
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Columbia Electric Mfg. Co.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Indicator Co. Inc.
Electric Products Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Georator Corp.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hertner Electric Co., The
Hoover Electric Co.
Instruments Corp., The
***INTERELECTRONICS CORP.**
International Research Associates
Jack & Heintz, Inc.
Kurz & Root Co.
La Pointe Industries Inc.
Leach Corp.
***MOTOR GENERATOR CORP.**
Motoresearch Co.
Northwestern Electric Co.
D. W. Onan & Sons Inc.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Patterson, Moos Div.-Universal Winding Co., Inc.
Redmond Co., Inc.
Servomechanisms, Inc.
Small Motors Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Talley Corp., The
Task Corp.
Trindl Products, Ltd.
Varo Mfg. Co.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wickfield, Inc.
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.

Electric D. C.

Air Logistics Corp.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Louis Allis Co., The
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Columbia Electric Mfg. Co.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Indicator Co. Inc.
Electric Products Co., The
Electronics Dept., Hamilton Standard Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Georator Corp.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hertner Electric Co., The
Hoover Electric Co.
Instruments Corp., The
***INTERELECTRONICS CORP.**
Jack & Heintz, Inc.
Kurz & Root Co.
La Pointe Industries Inc.
Leach Corp.
Lincoln Electric Co., The
***MOTOR GENERATOR CORP.**
Motoresearch Co.
Northwestern Electric Co.
D. W. Onan & Sons Inc.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Redmond Co., Inc.
Servomechanisms, Inc.
Small Motors Inc.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Talley Corp., The
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wickfield, Inc.
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.

Engine Driven

Air Logistics Corp.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
American Electronics, Inc.
Barker Sales Co.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Columbia Electric Mfg. Co.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electric Products Co., The
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Georator Corp.
Hammett Electric Co.
International Fermont Machinery Co., Inc.
Jack & Heintz, Inc.
La Pointe Industries Inc.
Leach Corp.
***MOTOR GENERATOR CORP.**
Motoresearch Co.
D. W. Onan & Sons Inc.
Ready Power Co., The
Varo Mfg. Co.
Westinghouse Electric Corp.
***WHITE DIESEL ENGINE DIV., THE WHITE MOTOR CO.**
Wickfield, Inc.
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.

Frequency

Adler Electronics, Inc.
Alto Scientific Co., Inc.
American Electronics, Inc.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Bulova Watch Co., Electronics Div.
Consolidated Avionics Corp.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Erie Resistor Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Gray & Huleguard, Inc.
Hertner Electric Co., The
***INTERELECTRONICS CORP.**
International Research Associates
Kay Electric Co.
Lampkin Labs. Inc.
La Pointe Industries Inc.
Gerard G. Leeds Co., Inc.

Manson Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motoresearch Co.
*POTTER AERONAUTICAL CORP.
Resdel Engrg. Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Varo Mfg. Co.
Wacline, Inc.
Waveforms, Inc.
Wickes Engrg. & Construction Co. Inc.

Function

Consolidated Avionics Corp.
Diehl Mfg. Co.
*INTERELECTRONICS CORP.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Resdel Engrg. Corp.
Telectro Industries Corp.

Hand Driven

Redmond Co., Inc.
Wincharger Corp.

High Frequency Power

Acoustica Associates, Inc.
Airborne Instruments Lab., Inc.
Bogue Electric Mfg. Co.
D & R, Ltd.
Joe Davidson & Associates
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gray & Huleguard, Inc.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
C. I. Hayes, Inc.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Kurz & Root Co.
Leach Corp.
Lindberg Engrg. Co.
McKenna Labs.
*MOTOR GENERATOR CORP.
Motoresearch Co.
Northwestern Electric Co.
Resdel Engrg. Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
TKM Electric Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Wave Particle Corp.
*WESTINGHOUSE ELECTRIC CORP.

Liquid Oxygen

Air Products, Inc.
Herrick L. Johnston, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Superior Air Products Co.

Liquid Oxygen, Mobile

Air Products, Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Herrick L. Johnston, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.

Motor

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Barker Sales Co.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
D & R, Ltd.
Diehl Mfg. Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Eicor Div.-F. L. Jacobs Co.
Electric Indicator Co. Inc.
Electric Products Co., The
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Hammett Electric Co.
Helipot Corp.
Hertner Electric Co., The
Hoover Electric Co.
*INTERELECTRONICS CORP.
Kurz & Root Co.
La Pointe Industries Inc.
Leach Corp.
*MOTOR GENERATOR CORP.
Motordyne Inc.
Motoresearch Co.
Northwestern Electric Co.
Redmond Co., Inc.
Small Motors Inc.
Talley Corp., The
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.

Pulse

Adler Electronics, Inc.
Alto Scientific Co., Inc.
American Electronics Labs., Inc.
Centronix Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Electro-Pulse, Inc.
*INTERELECTRONICS CORP.
Kay Electronic Co.
La Pointe Industries Inc.
Leach Corp.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Orbitran Co., Inc.
Resdel Engrg. Corp.
Milton Roy Co.
Skiatron Electronics & Television Corp.
Technitrol Engrg. Co.
*TELERAD MFG. CORP.

Sync

Adler Electronics, Inc.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Hammett Electric Co.
*INTERELECTRONICS CORP.
Kurz & Root Co.
La Pointe Industries Inc.
Skiatron Electronics & Television Corp.
Tel-Instrument Electronics Corp.
Thompson Products, Inc.

Sync, Studio

Dunlap Electronics, Inc.
Hammett Electric Co.
*INTERELECTRONICS CORP.
Skiatron Electronics & Television Corp.
Tel-Instrument Electronics Corp.

Sync, Stretchers

Adler Electronics, Inc.
Hammett Electric Co.
Skiatron Electronics & Television Corp.

Winddriven Generating Equipment

D & R, Ltd.
Joe Davidson & Associates
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammett Electric Co.
Munston Mfg. & Service, Inc.
Wincharger Corp.

GENERATORS, ELECTRONIC

Advance Industries, Inc.
Alto Scientific Co., Inc.
Amerac Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., York Div.
Boonton Radio Corp.
Briggs Associates, Inc.
Burroughs Corp.
Canoga Corp. of California
Consolidated Avionics Corp.
Cubic Corp.
Joe Davidson & Associates
Dynac, Inc.
General Communication Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
*KAHN & CO., INC.
Kay Electric Co.
La Pointe Industries Inc.
Marconi Instruments
McKenna Labs.
Munston Mfg. & Service, Inc.
Ernst Norrman Laboratories
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
Teletronics Laboratory Inc.
Tel-Instrument Electronics Corp.
Varo Mfg. Co.

Am-Fm

Adler Electronics, Inc.
Advance Industries, Inc.
Boonton Radio Corp.
Collins Radio Co.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
La Pointe Industries Inc.
Marconi Instruments
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Radio Corporation of America, Defense Electronic Products
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.

Harmonic Frequency

Adler Electronics, Inc.
Advance Industries, Inc.
Aircom Inc.
Bendix Aviation Corp., York Div.
Bulova Watch Co., Electronics Div.
Consolidated Avionics Corp.
Demornay-Bonardi
Graflex, Inc.
*INTERELECTRONICS CORP.
Kay Electric Co.
La Pointe Industries Inc.
Manson Laboratories, Inc.
Marconi Instruments
Ernst Norrman Laboratories
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Varo Mfg. Co.

Microwave

Adler Electronics, Inc.
Airborne Instruments Lab., Inc.
Aircom Inc.
Amerac Inc.
Bendix Aviation Corp., York Div.
California Technical Industries, Div.-Textron Inc.
Canoga Corp. of California
Cohan Epner Co. Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Dynac, Inc.
Geisler Labs.
General Communication Co.
J-V-M Microwave Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kay Electric Co.
La Pointe Industries Inc.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Saratoga Industries
Stromberg-Carlson, Electronics Div.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Wave Particle Corp.
Weinschel Engrg.

Noise

Airborne Instruments Lab., Inc.
Bendix Aviation Corp., York Div.
Burroughs Corp.
Chesapeake Instrument Corp.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Dunlap Electronics, Inc.
General Sound Control, Inc.
Hickok Electrical Instrument Co., The
Intercontinental Dynamics Corp.
Kay Electric Co.
La Pointe Industries Inc.
Marconi Instruments
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Saratoga Industries
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Picture Signal

Adler Electronics, Inc.
Hickok Electrical Instrument Co., The
Kay Electric Co.
La Pointe Industries Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Thompson Products, Inc.

Pulse

Adler Electronics, Inc.
Advance Industries, Inc.
Alto Scientific Co., Inc.
Amerac Inc.
American Electronic Labs., Inc.
Bendix Aviation Corp., York Div.
Briggs Associates, Inc.

. . . ground support

Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
Bulova Watch Co., Electronics Div.
Burroughs Corp.
Canoga Corp. of California
Centronix Inc.
Consolidated Avionics Corp.
Cubic Corp.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Demornay-Bonardi
Dunlap Electronics, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Pulse, Inc.
Erie Resistor Corp.
General Communication Co.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hamner Electronics Co., Inc.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
Kay Electric Co.
La Pointe Industries Inc.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Munston Mfg. & Service, Inc.
Ernst Norrman Laboratories
Orbitran Co., Inc.
Philco Corp., Government & Industrial Divs.
*RADIATION, INC.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Resdel Engrg. Corp.
Rese Engrg., Inc.
Rutherford Electronics Co.
Saratoga Industries
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Technitrol Engrg. Co.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Teletronics Laboratory Inc.
Ultradyne, Inc.
Walkirt Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Waveforms, Inc.

Square Wave

Alto Scientific Co., Inc.
Antlab Inc.
Briggs Associates, Inc.
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Consolidated Avionics Corp.
Cubic Corp.
Dunlap Electronics, Inc.
General Communication Co.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
International Research Associates
Motordyne Inc.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Rutherford Electronics Co.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Ultradyne, Inc.
Varo Mfg. Co.
Walkirt Co.
Weinschel Engrg.

Ultrasonic

Acoustica Associates, Inc.
Alcar Instruments, Inc.
Blackstone Corp.
Branson Instruments, Inc.
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Chesapeake Instrument Corp.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Joe Davidson & Associates
General Nuclear Corp.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
*KAHN & CO., INC.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Massa Labs., Inc.
McKenna Labs.
John B. Moore Corp.
Narda Ultrasonics Corp., The
Radio Corporation of America, Defense Electronic Products
Ryan Aeronautical Co.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Skiatron Electronics & Television Corp.

Variable Frequency

Airborne Instruments Lab., Inc.
Bendix Aviation Corp., York Div.
Bulova Watch Co., Electronics Div.
Burroughs Corp.
Canoga Corp. of California
Consolidated Avionics Corp.
Joe Davidson & Associates
Dunlap Electronics, Inc.
Dynac, Inc.
Electro-Pulse, Inc.
Erwood, Inc.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
International Research Associates
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Technitrol Engrg. Co.
Telectro Industries Corp.
Teletronics Laboratory, Inc.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Utradyne, Inc.
Varo Mfg. Co.
Waveforms, Inc.

Waveform

Adler Electronics, Inc.
Bulova Watch Co., Electronics Div.
Consolidated Avionics Corp.
Cubic Corp.
Electronic Measurements Corp.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
George A. Philbrick Researches, Inc.
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Rutherford Electronics Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Ultradyne, Inc.

GENERATORS, ELECTRONIC, SIGNAL

Alpha Instrument Co.
Alto Scientific Co., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
BJ Electronics, Borg-Warner Corp.
Boonton Radio Corp.
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Dunlap Electronics, Inc.
Dynac, Inc.
Electronic Measurements Corp.
General Communication Co.
Hammett Electric Co.
International Crystal Mfg. Co., Inc.
Marconi Instruments
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Varo Mfg. Co.

a-f

Adler Electronics, Inc.
Alpha Instrument Co.
Alto Scientific Co., Inc.
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Dunlap Electronics, Inc.
Dynac, Inc.
Electronic Measurements Corp.
Elm Mfg. Co., Inc.
Erwood, Inc.
Hickok Electrical Instrument Co., The
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
*INTERELECTRONICS CORP.
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

f-m

Adler Electronics, Inc.
Advance Industries, Inc.
Alpha Instrument Co.
Bendix Aviation Corp., York Div.
Boonton Radio Corp.
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Dunlap Electronics, Inc.
Electronic Measurements Corp.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
Kay Electric Co.
Marconi Instruments
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.

r-f

Adler Electronics, Inc.
Advance Industries, Inc.
Airborne Instruments Lab., Inc.
Aircom, Inc.
Alpha Instrument Co.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Boonton Radio Corp.
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Centronix, Inc.
Dunlap Electronics, Inc.
Dynac, Inc.
Ferris Instrument Co.
General Communication Co.
General Instrument Corp., Defense Products Div.
Hickok Electrical Instrument Co., The
International Crystal Mfg. Co., Inc.
J-V-M Microwave Co.
Kay Electric Co.
Lavoie Labs., Inc.
Manson Laboratories, Inc.
Marconi Instruments
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Resdel Engrg. Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.

shf

Adler Electronics, Inc.
Canoga Corp. of California
Geisler Labs.
General Communication Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Marconi Instruments
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Wave Particle Corp.

Single Sideband

Adler Electronics, Inc.
Canoga Corp. of California
Ferris Instrument Co.
Hycon Eastern, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Manson Laboratories, Inc.
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
Standard Electronics Div., Radio Engrg. Labs., Inc.
Telectro Industries Corp.
Telonic Industries, Inc.
Ultradyne, Inc.

Sweeping

Adler Electronics, Inc.
BJ Electronics, Borg-Warner Corp.
Boonton Radio Corp.
Canoga Corp. of California
Dynac, Inc.
Geisler Labs.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Philco Corp., Government & Industrial Divs.
Precision Apparatus Co., Inc.
Skiatron Electronics & Television Corp.
Standard Electronics Div., Radio Engrg. Labs., Inc.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Wave Particle Corp.

Television Synchronizing

Adler Electronics, Inc.
Canoga Corp. of California
Hickok Electrical Instrument Co., The
Kin Tel Div.-Cohu Electronics, Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Thompson Products, Inc.

uhf or vhf

Aircom Inc.
BJ Electronics, Borg-Warner Corp.
Boonton Radio Corp.
***COOPER DEVELOPMENT CORP.**
Ferris Instrument Co.
General Railway Signal Co.
Manson Laboratories, Inc.
Marconi Instruments
Munston Mfg. & Service, Inc.
Northeast Electronics Corp.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
***RADIATION, INC.**
Saratoga Industries
Skiatron Electronics & Television Corp.
Technical Oil Tool Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Weinschel Engrg.

GRAIN, ALUNDUM

Morganite, Inc.
Norton Co.

GRAPHITE, COLLOIDAL

Acheson Colloids Co., Div.-Acheson Industries, Inc.
Alpha-Molypote Corp.
Carbone Corp., The
Grafo Colloids Corp.

GRAPHITE, LUBRICATING

Alpha-Molypote Corp.
Drilube Co.
Electrofilm, Inc.
Grafo Colloids Corp.
Kano Labs.

GREASES, VACUUM

Kelsey-Hayes Co.
Silicones Div.-Union Carbide Corp.

GRID FRAMES

G. M. Dykes Iron Works, Inc.
Twix Mfg. Co., Inc.
***WASHINGTON ALUMINUM CO., INC.**

GRIDS

Chart-Pak, Inc.
G. M. Dykes Iron Works, Inc.
United Mfg. Co., The

GUN MOUNTS, TELEVISION

Aeroflex Corp., The, Aeroflex Labs. Div.
Aircraft Standards, Inc.
American Welding & Mfg. Co., The
G. M. Dykes Iron Works, Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Standard Armament Inc.
Thompson Products, Inc.

GUNS, SOLDERING

Eisler Engrg. Co., Inc.
P. Wall Mfg. Co.

HAMMERS

***BILLINGS & SPENCER CO., THE**
Black & Decker Mfg. Co., The
Capewell Mfg. Co.
Green, Tweed & Co.
Superior Pneumatic & Mfg., Inc.

HANDLES

Adams Rite Mfg. Co.
Chassis-Trak, Inc.
Dayton Mfg. Co., Inc.
Dimco-Gray Co.
Friez Instrument Div.-Bendix Aviation Corp.
General Logistics, Div.-Aeroquip Corp.
Goe Engrg. Co.
Olympic Plastics Co., Inc.
Star Engraving Co., Ltd.
Vemaline Products Co.

HANDLES, LEATHER

Auburn Mfg. Co., The

"The reason birds can fly . . . is simply that they have perfect faith, for to have faith is to have wings."
. . . Sir James Matthew Barrie

When science began, man's faith in his own judgment often preceded the established fact. Today, however, with aerodynamics and other sciences *faith is based on fact.*

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HAND SETS

International Electric Industries, Inc.
Roflan Co., The
Shure Brothers, Inc.
Telectro Industries Corp.

HEAT TRANSFER CONTROL SYSTEMS

American Air Filter Co., Defense Products Div.
American Research & Mfg. Corp.
Applied Dynamics Corp.
Bell & Gossett Co.
CDC Control Services, Inc.
Dunham-Bush Inc.
***EASTERN INDUSTRIES, INC.**
Ellis & Watts Products, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
E. Vernon Hill & Co.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Herrick L. Johnston, Inc.
Joseph Kaye & Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
***RYAN INDUSTRIES**
Scientific Instrument Co.
South Wind Div., Stewart-Warner Corp.
Stearns-Roger Mfg. Co.
Thompson Products, Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**

HEAT TREATING SERVICE

Atlas E-E Corp.
Bell & Gossett Co.
J. P. DeVine Mfg. Co.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Goodyear Aircraft Corp.
***HARTFORD MACHINE SCREW CO., DIV.-STANDARD SCREW CO.**
A. F. Holden Co., The
Ladish Co.
Modglin Co. Inc.
Papesch & Kolstad, Inc.
H. K. Porter Inc.
Positive Lock Washer Co., The
Skinner Precision Products
Solar Aircraft Co.

HEATER MUFFLER ASSEMBLIES

Hastings Plastics Inc.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Joseph Kaye & Co.
Warren Mfg. Div., Warren Brothers Roads Co.

HEATERS

Acme Electric Heating Co.
American Air Filter Co., Defense Products Div.
Cutler-Hammer Inc.
Electric Parts Corp.
Electrofilm, Inc.
Electromode, Div.-Commercial Controls Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
B. F. Goodrich Aviation Products
Gremco, Inc.
C. G. Hokanson Co., Inc.
A. F. Holden Co., The
***HUNTER MFG. CO.**
Janco Corp.
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
National Airoil Burner Co.
***RYAN INDUSTRIES**
Safeway Heat Elements, Inc.
Selas Corp. of America
Siebring Mfg. Co.
South Wind Div., Stewart-Warner Corp.
Statikil, Inc., Div.-The J. E. Doyle Co.
Trane Co., The
***UNITED AIRCRAFT PRODUCTS. INC.**
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.
Warren Mfg. Div., Warren Brothers Roads Co.

Ground portable

***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**

HEATING EQUIPMENT, FLEXIBLE

Electrofilm, Inc.
Electro-Flex Heat, Inc.
Electromode, Div.-Commercial Controls Corp.
Elektro-Serv Co.
First Electronics Corp., The
General Electric Co., Apparatus Sales Div.
B. F. Goodrich Aviation Products
***HUNTER MFG. CO.**
***JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.**
L. O. F. Glass Fibers Co.
National Airoil Burner Co.
***RYAN INDUSTRIES**
Safeway Heat Elements, Inc.
Seaman Products

HINGES

Bridgwater Machine Co.
Corbin Products Div.
Dayton Mfg. Co., Inc.
Dumont Aviation Associates
G. M. Dykes Iron Works, Inc.
Walter K. Jaros, Aircrafters
Twix Mfg. Co., Inc.

HOISTS, GROUND

Air Logistics Corp.
Alad Aluminum Ladder Corp.
All American Aircraft Products, Inc.
Aro Equipment Corp., The
Calcor Corp., Aircraft Div.
Albert H. Cayne Equipment Corp.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.
Clark Equipment Co.
Coffing Hoist Div., Duff-Norton Co.
Conco Engrg. Works
Joyce Cridland Co., The
Cromer Mfg. & Engrg., Inc.
Detroit Hoist & Machine Co.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
Gardner-Denver Co.
Walter K. Jaros, Aircrafters
Joy Mfg. Co.
Kelsey-Hayes Co.
Modglin Co. Inc.
O & M Machine Co., Inc.
Pacific Coast Engrg. Co.
Pitman Mfg. Co.
***REGENT JACK MFG. CO., INC.**
Robot Appliances Inc.
Sancor Corp.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
***WASHINGTON ALUMINUM CO., INC.**
Wells Industries Corp.
Wheland Co., The
Wickfield, Inc.

HOSE

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Anchor Packing Co., The
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Chiksan Co.
Continental Rubber Works
Electric Hose & Rubber Co.
B. F. Goodrich Aviation Products
Hewitt-Robins, Inc.
Quaker Rubber Div.-H. K. Porter Co., Inc.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
Stainless Steel Products, Inc.
Stratoflex, Inc.
Titeflex, Inc.
Weatherhead Co., The

Air

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Anchor Coupling Co. Inc.
Anchor Packing Co., The
Arrowhead Products, Div.-Federal-Mogul-Bower Bearings, Inc.
Cardox Corp.
Chiksan Co.
Continental Rubber Works
Devilbiss Co., The
Electric Hose & Rubber Co.
Flexaust Co., The
Flexonics Corp.
B. F. Goodrich Aviation Products
Gray Co., Inc.
Hewitt-Robins, Inc.
Imperial Brass Mfg. Co., The
Marco Industries Co.
Parker-Hannifin Corp.
Quaker Rubber Div.-H. K. Porter Co., Inc.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
M. L. Snyder & Son, Inc.
Stainless Steel Products, Inc.
Stratoflex, Inc.
Superior Pneumatic & Mfg., Inc.
Titeflex, Inc.
Weatherhead Co., The

Assemblies, Flexible

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Anchor Coupling Co. Inc.
Anchor Packing Co., The
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Atlantic Metal Hose Co. Inc.
Avica Corp.
Cardox Corp.
Chiksan Co.
Co-Operative Industries, Inc.
Electric Hose & Rubber Co.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Hewitt-Robins, Inc.
Imperial Brass Mfg. Co., The
Marco Industries Co.
J. J. Monaghan Co., Inc.
Parker-Hannifin Corp.
Resistoflex Corp.
Ronan & Kunzl Inc., Cryogenic Div.
Servicair Co.
Stainless Steel Products, Inc.
Stratoflex, Inc.
Titeflex, Inc.
Twix Mfg. Co., Inc.
Weatherhead Co., The

Flexible, Metallic

Allied Plastics Supply Corp.
American Brass Co., The
American Brass Co., American Metal Hose Div.
Anchor Packing Co., The
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Atlantic Metal Hose Co. Inc.
Avica Corp.
Co-Operative Industries, Inc.
D K Mfg. Co.
Electric Hose & Rubber Co.
Federal Metal Hose Corp.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
Hallett Mfg. Co.
Johnson Metal Hose, Inc.
Marco Industries Co.
Rodney Metals Inc.
Servicair Co.
Stainless Steel Products, Inc.
Titeflex, Inc.

Flexible, Non-Metallic

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Anchor Packing Co., The
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Chiksan Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Continental Rubber Works
C. R. Daniels, Inc.
Electric Hose & Rubber Co.
Flexaust Co., The
Flexonics Corp.
B. F. Goodrich Aviation Products
Harman Equipment Co.
Hewitt-Robins, Inc.
Imperial Brass Mfg. Co., The
Joclin Mfg. Co.
Parker-Hannifin Corp.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
Roberts Toledo Rubber Co., The
Rubbercraft Corp. of California
M. L. Snyder & Son, Inc.
Stratoflex, Inc.
Titeflex, Inc.
Weatherhead Co., The
Zippertubing Co., The

Hydraulic

Aeroquip Corp.
Allied Plastics Supply Corp.
American Brass Co., American Metal Hose Div.
Anchor Coupling Co. Inc.
Anchor Packing Co., The
Continental Rubber Works
Electric Hose & Rubber Co.
Flexible Metal Hose Mfg. Co.
Flexonics Corp.
B. F. Goodrich Aviation Products
Gray Co., Inc.
Imperial Brass Mfg. Co., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Parker-Hannifin Corp.
Pyles Industries, Inc.
Raybestos-Manhattan, Inc.
Resistoflex Corp.
Stainless Steel Products, Inc.
Stewart-Warner Corp.
Stratoflex, Inc.
Titeflex, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Weatherhead Co., The

HUMIDITY CONTROL SYSTEMS

Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
CDC Control Services, Inc.
Cal-Air Conditioning Co.
Driaire, Inc.
Dryomatic Corp.
Ellis & Watts Products, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Instruments Corp., The

***KAHN & CO., INC.**
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Missimers Inc.
Powers Regulator Co., The
Research Products Corp.
Scientific Instrument Co.
Universal Dynamics Corp.
Weighing & Control Components, Inc.
Wells Industries Corp.

INDICATORS, OXYGEN

Aro Equipment Corp., The
Bergen Labs.
Ellison Draft Gage Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Humidial Co.
Herrick L. Johnston, Inc.
Mine Safety Appliances Co.
Simmonds Aerocessories, Inc.

INDICATORS, WIND DIRECTION

Friez Instrument Div.-Bendix Aviation Corp.
E. Vernon Hill & Co.
Instruments Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Victory Engineering Corp.

INDICATORS, WIND SPEED, ELECTRONIC

Chicago Div.-American Bosch Arma Corp.
Electronics Dept., Hamilton Standard Div.-United Aircraft Crop.
Friez Instrument Div.-Bendix Aviation Corp.
Hickok Electrical Instrument Co., The
Instruments Corp., The
Leeds & Northrup Co.
Master Specialties Co.
Skiatron Electronics & Television Corp.
Victory Engineering Corp.

INDUCTION HEATING EQUIPMENT

General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Lindberg Engrg. Co.
Papesch & Kolstad, Inc.
Vacuum Tube Products Co. Inc.
***WESTINGHOUSE ELECTRIC CORP.**

INTERCOMMUNICATION SYSTEMS

American Research & Mfg. Corp.
Centronix Inc.
Du Kane Corp.
Executone, Inc.
Feiler Engrg. & Mfg. Co.
Lane Electronics Mfg. Corp.
Motorola Inc., Military Marketing Div.
***SEEBURG CORP., THE**
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Talk-A-Phone Co.
Telectro Industries Corp.

INTERFERENCE EQUIPMENT, R-F

Centronix Inc.
***DATA-CONTROL SYSTEMS INC.**
Hoover Electronics Co.
Interference Measurement Laboratory, Inc.
Motorola Inc., Military Marketing Div.
Panoramic Radio Products, Inc.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Telectro Industries Corp.

INVERTERS, DC-AC

Airborne Accessories Corp.
Alto Scientific Co., Inc.
American Research & Mfg. Corp.
American Television & Radio Co.
Arnoux Corp.
Avion Div.-ACF Industries, Inc.
Ballantine Labs., Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Crescent Engrg. & Research Co.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electronic Techniques, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hoover Electric Co.
***INTERELECTRONICS CORP.**
International Research Associates
Jack & Heintz, Inc.
Jordan Electronics Div.-Victoreen Instrument Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kurz & Root Co.
Motorola Inc., Military Marketing Div.
Ernst Norrman Laboratories
Opad Electric Co.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Pesco Products Div.—Borg-Warner Corp.
Redmond Co., Inc.
Sangamo Electric Co.
Small Motors Inc.
Sun Electric Corp.
Telectro Industries Corp.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.

INVERTERS, MEASUREMENT

Bendix Aviation Corp., Red Bank Div.
Goslin Electric & Mfg. Co.
Hammett Electric Co.
Motorola Inc., Military Marketing Div.
Opad Electric Co.
Stevens-Arnold Inc.
Sun Electric Corp.
Telectro Industries Corp.
Varo Mfg. Co.

INVERTERS, POWER SUPPLY

Airborne Accessories Corp.
Amelco, Inc.
American Research & Mfg. Corp.
American Television & Radio Co.
Arnoux Corp.
Avion Div.-ACF Industries, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Eicor Div.-F. L. Jacobs Co.
Ford Instrument Co., Div.-Sperry Rand Corp.
Electronic Techniques, Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hertner Electric Co., The
***INTERELECTRONICS CORP.**
International Research Associates
Jordan Electronics, Div.-Victoreen Instrument Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kurz & Root Co.
Maico Electronics, Inc.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Opad Electric Co.
Sun Electric Corp.
Telectro Industries Corp.
Thompson Products, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.

INVERTERS, RECTIFIER

American Research & Mfg. Corp.
Arnoux Corp.
Avion Div.-ACF Industries, Inc.
Bogue Electric Mfg. Co.
Joe Davidson & Associates
Electronic Techniques, Inc.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Hammett Electric Co.
***INTERELECTRONICS CORP.**
Motorola Inc., Military Marketing Div.
Opad Electric Co.
Sun Electric Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.

IRONS, SOLDERING

Acoustica Associates, Inc.
American Electrical Heater Co.
Ideal Industries, Inc.
General Electric Co., Apparatus Sales Div.
Selas Corp. of America
Telectro Industries Corp.
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.
P. Wall Mfg. Co.
Zephyr Mfg. Co. Inc.

ISOLATION UNITS

Federal Shock Mount Div.-The Korfund Co.
E. F. Johnson Co.
Multi-Amp Corp.
United Transformer Corp.
Wilcox Electric Co., Inc.

JACKS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
Champion Airquipment Inc.
Connector Corp.
Joyce Cridland Co., The
G. W. Galloway Co.
General Cement Mfg. Co., Div.-Textron Inc.
Hein-Werner Corp.
E. F. Johnson Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kemp Aero Products, Div.-Kemp Inc.
Kemp Inc.
Pacific Coast Engrg. Co.
Pitman Mfg. Co.
H. K. Porter Inc.
***REGENT JACK MFG. CO., INC.**
Richards Electrocraft, Inc.
Sancor Corp.
Superex Electronics Corp.
Switchcraft, Inc.
Telectro Industries Corp.
Templeton, Kenly & Co.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
Vard Inc.
Wheland Co., The

JUMPERS, BONDING

Aerolite Electronics Corp.
Hallett Mfg. Co.
International Electric Industries, Inc.
Janco Corp.
Telectro Industries Corp.

KITS, MODIFICATION

Abrams Instrument Corp.
Aerolite Electronics Corp.
***COOPER DEVELOPMENT CORP.**
***CORNELIUS CO., THE**
Eaton Mfg. Co., Inc., Fredric Flader Div.
First Electronics Corp., The
Goodyear Aircraft Corp.
Hydra-Power Corp.
International Pump & Machine Works
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Modglin Co. Inc.
Republic Aviation Corp., Guided Missiles Div.
Richards Electrocraft, Inc.
Superex Electronics Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

KITS, GEIGER COUNTER

Eaton Mfg. Co., Inc., Fredric Flader Div.
Telectro Industries Corp.

KITS, PORTABLE LIGHTING

Barker Sales Co.
Blowers Inc.
Day-Ray Products, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Electronic Measurements Corp.
Engrg. Developments, Inc.
First Electronics Corp., The
Gremco, Inc.
Grimes Mfg. Co.
***PHOENIX PRODUCTS CO.**
Republic Aviation Corp., Guided Missiles Div.
Telectro Industries Corp.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

KITS, TEST EQUIPMENT

Abrams Instrument Corp.
Accessory Controls & Equipment Corp.
Brooks Rotameter Co.
Calcor Corp., Aircraft Div.
Centronix Inc.
***CORNELIUS CO., THE**
Eaton Mfg. Co., Inc., Fredric Flader Div.
First Electronics Corp., The
Ford Instrument Co., Div.-Sperry Rand Corp.
Goodyear Aircraft Corp.
Greenbrier Instruments Inc.
Hickok Electrical Instrument Co., The
E. Vernon Hill & Co.
***KAHN & CO., INC.**
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Multi-Amp Corp.
George L. Nankervis Co.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Precision Apparatus Co., Inc.
Radar Design Corp.
Republic Aviation Corp., Guided Missiles Div.
Rocketdyne Div., North American Aviation, Inc.
Schaffer Air Industries, Inc.
Sun Electric Corp.
Telectro Industries Corp.
Thompson Products, Inc.
United Mfg. Co. Div., The W. L. Maxson Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

LACQUERS

Delta Chemical Works, Inc.
Fidelity Chemical Products Corp.
Krylon, Inc.
Naz-Dar Co.
Vorac Co., The
Waldom Electronics Inc.

LAMINATORS, PLASTIC HIGH PRESSURE

Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
American Printed Circuits Co., Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bomyte Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Duracote Corp.
Franklin Fibre-Lamitex Corp.
Hastings Plastics Inc.
Joclin Mfg. Co.
Met-L-Wood Corp.
New England Laminates Co., Inc.
Raybestos-Manhattan, Inc.
St. Regis Paper Co.
Silicones Div.-Union Carbide Corp.
Star Engraving Co., Ltd.
Stevens Products, Inc.
Synthane Corp.
H. I. Thompson Fiber Glass Co.
Wappler, Inc.

LAMPS, INSPECTION

Art Specialty Co.
Baird-Atomic, Inc.
Blowers Inc.
Chicago Miniature Lamp Works
Day-Ray Products, Inc.
Engrg. Developments, Inc.
Hammett Electric Co.
*OPTO-METRIC TOOLS, INC.
Radiant Lamp Corp.
Shannon Luminous Materials Co.

LAMPS, PROJECTION

*COOPER DEVELOPMENT CORP.
Graflex, Inc.
Hammett Electric Co.
Radiant Lamp Corp.
*WESTINGHOUSE ELECTRIC CORP.

LAUNCHERS, AIRBORNE ROCKET

Aircraft Mechanics, Inc.
Aircraft Standards, Inc.
All American Aircraft Products, Inc.
American Car & Foundry Div., ACF Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Applied Design Co.
Basic Tool Industries, Inc.
Cleveland Pneumatic Tool Co., The, Div. Cleveland Pneumatic Industries, Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
*COOPER DEVELOPMENT CORP.
Cromer Mfg. & Engrg., Inc.
Dittmore-Freimuth Corp.
*DIVERSEY ENGRG. CO.
G. M. Dykes Iron Works, Inc.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Food Machinery & Chemical Corp., Ordnance Div.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Gremco, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Philco Corp., Government & Industrial Divs.
Propellex Chemical Corp.
Republic Aviation Corp., Guided Missiles Div.
Sancor Corp.
Sargent Engrg. Corp.
Shaw Metal Products Corp.
Standard Armament Inc.
Sun Electric Corp.
Stanley Aviation Corp.
Talco Engrg. Co., The
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Washington Technological Associates, Inc.
Wells Industries Corp.

LAUNCHERS, GROUND BASED MISSILES

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Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Aircraft Mechanics, Inc.
Aircraft Standards, Inc.
All American Aircraft Products, Inc.
American Car & Foundry Div., ACF Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Steel Foundries, Hammond Div.
Applied Design Co.
Basic Tool Industries, Inc.
*BAUSCH & LOMB OPTICAL CO.
Bendix Products Div., Bendix Aviation Corp.
E. W. Bliss Co.
Calcor Corp., Aircraft Div.
Champion Airquipment Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
Cromer Mfg. & Engrg., Inc.
Danly Machine Specialties, Inc.
G. M. Dykes Iron Works, Inc.
Dynametrics Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Food Machinery & Chemical Corp., Ordnance Div.
Four Wheel Drive Auto Co., The
*FRUEHAUF TRAILER CO.
G. W. Galloway Co.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Goodyear Aircraft Corp.
Gremco, Inc.
Haskell Engrg. & Supply Co.
Hicks Corp., The
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kaiser Steel Corp., Fabricating Div.
Kelsey-Hayes Co.
Loewy-Hydropress Div.—Baldwin-Lima-Hamilton
Macks Trucks, Inc., Govt. Div.
McDowell Co. Inc.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Nuclear Products-Erco. Div.-ACF Industries, Inc.
Opelika Welding, Machine & Supply, Inc.
Pacific Coast Engrg. Co.
Parish Pressed Steel, Div.-Dana Corp.
Philips & Davies Inc.
Propellex Chemical Corp.
Republic Aviation Corp., Guided Missiles Div.
Rucker Co., The
Sancor Corp.
Shaw Metal Products Corp.
Standard Armament Inc.
Sun Electric Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
*TRAILMOBILE INC.
United Mfg. Co., The
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Washington Technological Associates Inc.
Wayne Pump Co., The
Wells Industries Corp.
Wheland Co., The
Wickfield, Inc.

LENSES, INSPECTION

American Optical Co., Instrument Div.
Buhl Optical Co.
Eastman Kodak Co.
Elastic Stop Nut Corp. of America
Engrg. Developments, Inc.
*HAYWARD SCIENTIFIC GLASS CORP.
Librascope Inc.
O & S Research, Inc.
Pacific Universal Products Corp.
Star Engraving Co., Ltd.
Woolensak Optical Co.

LIGHT SUPPLIES

*COOPER DEVELOPMENT CORP.
Day-Ray Products, Inc.
Star Engraving Co., Ltd.
Telectro Industries Corp.

LIGHTING, COLD CATHODE

*COOPER DEVELOPMENT CORP.
General Scientific Equipment Co.
Kemlite Laboratories, Inc.
Julian A. McDermott Corp.
Star Engraving Co., Ltd.

LIGHTING EQUIPMENT, EMERGENCY

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
American Television & Radio Co.
Blowers Inc.
*COOPER DEVELOPMENT CORP.
*EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.
First Electronics Corp., The
Hammett Electric Co.
Hershey Mfg. Co.
International Electric Industries, Inc.
International Fermont Machinery Co., Inc.
Julian A. McDermott Corp.
*PHOENIX PRODUCTS CO.
M. L. Snyder & Son, Inc.
Star Engraving Co., Ltd.

LIGHTING EQUIPMENT, PRESET PANELS

*AMERICAN MACHINE & FOUNDRY CO.
Hammett Electric Co.
International Electric Industries, Inc.
Master Specialties Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.

LIGHTING EQUIPMENT, TOWER

First Electronics Corp., The
Hammett Electric Co.
Hershey Mfg. Co.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Wind Turbine Co.

LIGHTNING ARRESTERS

Airtron, Inc.
Garde Mfg. Co.
General Electric Co., Apparatus Sales Div.
Hi-Lo Manufacturing Corp.
Telectro Industries Corp.
Tricraft Products Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wind Turbine Co.

LIGHTS

Davenport Mfg. Co.
Grimes Mfg. Co.
Hammett Electric Co.

Arc

Hammett Electric Co.

Flood

Blowers Inc.
General Electric Co., Apparatus Sales Div.
Grimes Mfg. Co.
Hammett Electric Co.
International Electric Industries, Inc.
*PHOENIX PRODUCTS CO.
Pyle-National Co., The
Radiant Lamp Corp.
*WESTINGHOUSE ELECTRIC CORP.

Fluorescent

Alden Systems Co.
Day-Ray Products, Inc.
Grimes Mfg. Co.
Hammett Electric Co.
Marco Industries Co.
*WESTINGHOUSE ELECTRIC CORP.

Glow

Alden Systems Co.
Amglo Corp.
Chicago Miniature Lamp Works
Dialight Corp.
Hammett Electric Co.
Hudson Lamp Co.
Signalite Inc.
Ultra-Violet Products, Inc.

Incandescent

Alden Systems Co.
Chicago Miniature Lamp Works
Circon Component Corp.
*COOPER DEVELOPMENT CORP.
Dialight Corp.
General Cement Mfg. Co., Div.-Textron, Inc.
Grimes Mfg. Co.
Hammett Electric Co.
Hudson Lamp Co.
Marco Industries Co.
Pyle-National Co., The
Radiant Lamp Corp.
*WESTINGHOUSE ELECTRIC CORP.

Indicator

Alden Products Co.
Burroughs Corp., Electronic Tube Div.
Dialight Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Grimes Mfg. Co.
Hammett Electric Co.
Master Specialties Co.
Signalite Inc.
Star Engraving Co., Ltd.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
*WESTINGHOUSE ELECTRIC CORP.

Spot

Blowers Inc.
Grimes Mfg. Co.
Hammett Electric Co.
Radiant Lamp Corp.
*WESTINGHOUSE ELECTRIC CORP.

Stroboscopic Source

Amglo Corp.
Davenport Mfg. Co.
Edgerton, Germeshausen & Grier, Inc.
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LOCKS, DIAL

Amatom Electronic Hardware Co. Inc.
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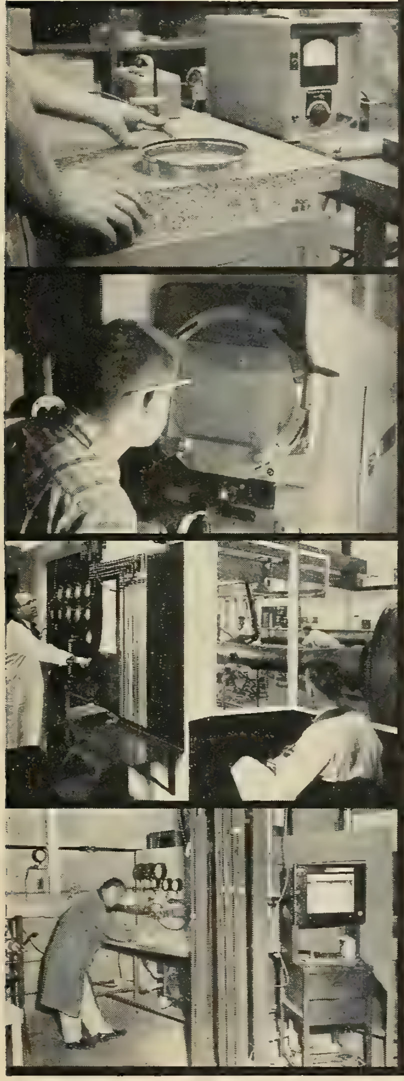

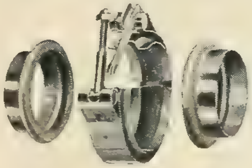

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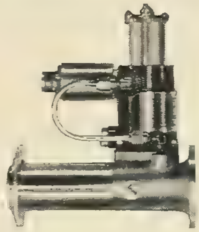

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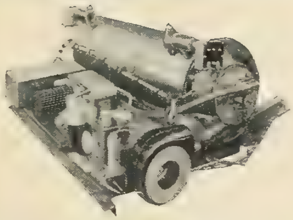

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Kemp Aero Products, Div.-Kemp Inc.
Pacific Div.-Bendix Aviation Corp.
Thompson Products, Inc.
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Weston Hydraulics, Ltd.

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Bridgwater Machine Co.
Dalmore Corp.
General Components Inc.
Goe Engrg. Co.
Keystone Electronics Corp.
Waldom Electronics Inc.

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Goe Engrg. Co.
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Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Sinclair Mfg. Co.
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Eclipse-Pioneer Div., Bendix Aviation Corp.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co., Inc.
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Sealectric Switch & Relay Corp.
M. Ten Bosch, Inc.

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Jas. H. Matthews & Co.
McKenna Labs.

Abrasive Cutting

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Engelberg Huller Co., Inc.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.

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Gremco, Inc.
International Radiant Corp.
Ready Power Co., The
Typhoon Air Conditioning Co., Div.-Hupp Corp.
Universal Dynamics Corp.

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Cosa Corp.
Hickok Electrical Instrument Co., The
Stewart-Warner Corp.
Warren Mfg. Div., Warren Brothers Roads Co.

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Cleveland Crane & Engrg. Co., The
Denison Engrg. Div., American Brake Shoe Co.
G. W. Galloway Co.
Philips & Davies Inc.
H. K. Porter Inc.
Rotex Punch Co., Inc.
T. W. & C. B. Sheridan Co.
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Paragon-Revolute Corp.
***TRAILMOBILE INC.**

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Barnes Development Co.
J. P. DeVine Mfg. Co.
Electron Products Inc.

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Auburn Spark Plug Co., Inc.
Black & Decker Mfg. Co., The
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Industrial Washing Machine Corp.
Gerard G. Leeds Co., Inc.
McKenna Labs.
Penetone Co., The
Pioneer-Central Div., Bendix Aviation Corp.
Siebring Mfg. Co.
Wye Industries

Coil Winding

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Cosa Corp.
Alfred Hofmann & Co.
Kahle Engrg. Co.
J. W. Miller Co.
Southwestern Industrial Electronics Co.

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Potter Aeronautical Corp.

Crystal Manufacturing & Finishing

P. R. Hoffman Co.
Kahle Engrg. Co.
NRC Equipment Corp.
United States Dynamics Corp.

Cutting

Ackerman Gould Co.
Barnes Development Co.
Black & Decker Mfg. Co., The
Cleveland Crane & Engrg. Co., The
Kahle Engrg. Co.
H. K. Porter Inc.
United Shoe Machinery Corp.
Wenco Mfg. Co.

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Anchor Metal Co. Inc.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
Lake Erie Machinery Corp.

Electric Soldering

Acoustica Associates, Inc.
Eisler Engrg. Co., Inc.
Kahle Engrg. Co.

Electron Tube

Kahle Engrg. Co.
Litton Engrg. Labs.
Telectro Industries Corp.

Electronic Balancing

Hickok Electrical Instrument Co., The

Electronic Transcribing

Barnes Development Co.
Curtiss-Wright Corp., Industrial & Scientific Products Div.

Engraving & Profiling

Barnes Development Co.
Cosa Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Green Instrument Co.
Onsrud Machine Works, Inc.
H. P. Preis Engraving Machine Co.

Forming

***BAUSCH & LOMB OPTICAL CO.**
Cleveland Crane & Engrg. Co., The
Denison Engrg. Div., American Brake Shoe Co.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
Kahle Engrg. Co.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Quick Charge Corp.
Stanat Mfg. Co., Inc.

Glass Working

Acme Industrial Co.
Denison Engrg. Div., American Brake Shoe Co.
Eisler Engrg. Co., Inc.
***HAYWARD SCIENTIFIC GLASS CORP.**
International Pump & Machine Works
Kahle Engrg. Co.
Litton Engrg. Labs.
O & S Research, Inc.
Philadelphia Scientific Glass Co.

Hermetic Sealing

Cedar Engrg. Div.-Control Data Corp.
Diamonite Products Mfg. Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Alfred Hofmann & Co.
International Pump & Machine Works
Kahle Engrg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Southwestern Industrial Electronics Co.
D. M. Steward Mfg. Co.

Impregnating

J. P. DeVine Mfg. Co.
Electron Products Inc.
Guardite Co., Div. of American-Marietta Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
NRC Equipment Corp.

Lamination Stacking

Cedar Engrg. Div.-Control Data Corp.
Denison Engrg. Div.-American Brake Shoe Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.

Marking

A&P Metal Products Mfg. Corp.
Ackerman Gould Co.
Acromark Co., The
W. H. Brady Co.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Denison Engrg. Div.-American Brake Shoe Co.
Jones & Lamson Machine Co.
Kahle Engrg. Co.
Jas. H. Matthews & Co.
Metal Masters, Inc.
H. P. Preis Engraving Machine Co.
Pyror Marking Products
Roovers-Lotson Corp.
H. C. Sweet Co.

Metal Forming

ACF Industries, Inc., Advanced Products Div.
E. W. Bliss Co.
Bullard Co., The
Cleveland Crane & Engrg. Co., The
Denison Engrg. Div.-American Brake Shoe Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
Kahle Engrg. Co.
Westlake Plastics, CrystalX Corp.
Loewy-Hydropress, Div.-Baldwin-Lima-Hamilton
Marchant Machining Corp.
Metal Forming Corp.
Metal Masters, Inc.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Penn-Michigan Mfg. Corp.
H. K. Porter Inc.
Quick Charge Corp.
Roland Teiner Co. Inc.
Rotex Punch Co., Inc.
Shaw Metal Products Corp.
T. W. & C. B. Sheridan Co.
Stanat Mfg. Co., Inc.
Superior Spinning & Stamping Co.
Torrington Co., The

Modular & Automatic Assembly

Alden Systems Co.
Barnes Development Co.
Denison Engrg. Div.-American Brake Shoe Co.
Alfred Hofmann & Co.
Kahle Engrg. Co.
Stromberg-Carlson, Electronics Div.

Photocopy & Whiteprint

Paragon-Revolute Corp.
Peerless Photo Products Inc.
Stromberg-Carlson, Electronics Div.

Plastic Press

E. W. Bliss Co.
Clark-Aiken Co., The
Crystal-X Corp.
Denison Engrg. Div.-American Brake Shoe Co.
G. W. Galloway Co.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
Truxton Industries, Inc.
Westlake Plastics, CrystalX Corp.

Riveting

Denison Engrg. Div.-American Brake Shoe Co.
Eyelet Tool Co. Inc.
B. F. Goodrich Aviation Products
Marchant Machining Corp
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Quick Charge Corp.
Superior Pneumatic & Mfg., Inc.
United Shoe Machinery Corp.

Shock Testing

***AMERICAN MACHINE & FOUNDRY CO.**
Columbia Research Labs.

G. W. Galloway Co.
Gulton Industries, Inc.
International Radiant Corp.
*RESEARCH ADVANCED DEVELOPMENT DIV.-AVCO MFG. CORP.
Warren Mfg. Div.-Warren Brothers Roads Co.

Soldering

Acoustica Associates, Inc.
Alpha Metals, Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Kahle Engrg. Co.
London Chemical Co., Inc.
Penn-Michigan Mfg. Corp.
Selas Corp. of America

Tube Manufacturing

Engelhard Industries Inc., D. E. Makepeace Div.
Alfred Hofmann & Co.
International Pump & Machine Works
Kahle Engrg. Co.
Litton Engrg. Labs.
Metal Forming Corp.

Wire Stripping

Artos Engrg. Co.
Reeve Electronics, Inc.

MAGNETIZERS & DEMAGNETIZERS

Anchor Specialty Mfg. Co. Inc.
Arnold Engrg. Co., The
Crucible Steel Co. of America
Electromation Co.
Green Rectifier Co.
Hammett Electric Co.
Indiana Steel Products Co., Inc.
Kinevox-Hallen
Librascope Inc.
Metallurgical Products Dept., General Electric Co.
Permag Corp.
Southwestern Industrial Electronics Co.

MATERIALS HANDLING EQUIPMENT

Alad Aluminum Ladder Corp.
Alden Systems Co.
American Conveyor Co.
*AMERICAN MACHINE & FOUNDRY CO.
American Research & Mfg. Corp.
American Welding & Mfg. Co., The
Champion Airquipment Inc.
Champion Co., The
Chisholm-Moore Hoist Div.-Columbus McKinnon Chain Corp.
Cleveland Crane & Engrg. Co., The
Fairbanks Co., The
Food Machinery & Chemical Corp., Ordnance Div.
Four Wheel Drive Auto Co., The
*FRUEHAUF TRAILER CO.
Harvey Aluminum
Walter J. Hyatt Co., The
Industrial Television Inc.
Kaiser Steel Corp., Fabricating Div.
R. C. Mahon Co., The
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Pettibone Mulliken Corp.
Pitman Mfg. Co.
*RESEARCH & ADVANCED DEVELOPMENT DIV.-AVCO MFG. CORP.
Stearns-Roger Mfg. Co.
Stewart-Warner Corp.
Telectro Industries Corp.
United Mfg. Co., The
Vickers Inc., Div.-Sperry Rand
Washington Technological Associates Inc.
Wells Industries Corp.
Albert Wesling & Sons Inc.
Wickfield, Inc.

MEGAPHONES, ELECTRONIC

Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

MICROPHONES

Elgin National Watch Co.
International Research Associates
Photocon Research Products
Roanwell Corp.
Roflan Co., The
Rowe Industries
Shure Brothers, Inc.
Southwestern Industrial Electronics Co.
T-C Div.—Dyna-Empire, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Universal Microphone Co.
Victor Electric Wire & Cable Corp.

MISSILES, GROUND CHECK-OUT-EQUIPMENT

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
ACF Industries, Inc., Advanced Products Div.
Accessory Controls & Equipment Corp.
Acoustica Associates, Inc.
Advance Industries, Inc.
Aeroquip Corp.
Aircraft Armaments, Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
American Car & Foundry Div.-ACF Industries, Inc.
American Electronics, Inc., Data-Tronics Div.
*AMERICAN MACHINE & FOUNDRY CO.
American Research & Mfg. Corp.
Analogue Controls, Inc.
Anderson, Greenwood & Co.
Arma Div.-American Bosch Arma Corp.
Arnolt Corp.
Auto-Control Labs., Inc.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Barber-Colman Co.
Basic Tool Industries, Inc.
Bendix Aviation Corp., York Div.
Bendix Products Div.-Bendix Aviation Corp.
Bogue Electric Mfg. Co.
Calcor Corp., Aircraft Div.
Cardinal Instrumentation Corp.
Centronix Inc.
Chicago Div.-American Bosch Arma Corp.
Collins Radio Co.
Consolidated Avionics Corp.
Consolidated Diesel Electric Corp., Test Equip. Div.
*COOPER DEVELOPMENT CORP.
James Cunningham Son & Co., Inc.
*DATA-CONTROL SYSTEMS INC.
Davidson Mfg. Co.
Dynametrics Corp.
Eclipse-Pioneer Div.-Bendix Aviation Corp.
Electronic Engrg. Co. of California
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Erwood Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Fenske Fedrick & Miller Co.
Food Machinery & Chemical Corp., Ordnance Div.
Ford Instrument Co., Div.-Sperry Rand Corp.
Garde Mfg. Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geisler Labs.
General Controls Co.
General Electric Co., Missile & Ordnance Systems Dept. (Pa.)
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Goodyear Aircraft Corp.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Gremco Inc.
Guardian Electric Mfg. Co.
Hallamore Electronics Co.
Hoover Electronics Co.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kaiser Steel Corp., Fabricating Div.
Kearfott Co., Inc.
Lane Electronics Mfg. Corp.
*WALLACE O. LEONARD, INC.
Librascope Inc.
Link Aviation, Inc.
Loewy-Hydropress, Div.—Baldwin-Lima-Hamilton
W. L. Maxson Corp., The
McDowell Co. Inc.
Mechanical Div.-General Mills, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Milman Engrg. Co.
Minco Products, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Modglin Co. Inc.
Motorola Inc., Military Marketing Div.
George L. Nankervis Co.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
*PACKARD-BELL ELECTRONICS CORP.
Ralph M. Parsons Co., The, Electronics Div.
Philco Corp., Government & Industrial Divs.
Pioneer-Central Div., Bendix Aviation Corp.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Resdel Engrg. Corp.
*RHEEM MFG. CO., ELECTRONICS DIV.
Rocketdyne Div., North American Aviaiton, Inc.
Ryan Aeronautical Co.
Schaffer Air Industries, Inc.
Servomechanisms, Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Stromberg-Carlson, Electronics Div.
Sun Electric Corp.
Stanley Aviation Corp.
Technical Oil Tool Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
*TRAILMOBILE, INC.
United Mfg. Co. Div., The W. L. Maxson Corp.
United States Chemical Milling Corp.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
*WAHINGTON ALUMINUM CO., INC.
Washington Technological Associates Inc.
Wells Industries Corp.
Wickfield, Inc.
Winder Aircraft Corp. of Fla.

MOTORS, HYDRAULIC

*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.

NAILS, SPECIAL

Allmetal Screw Products Co., Inc.
Capewell Mfg. Co.
Copperweld Steel Co., Wire & Cable Div.
Corbin Products Div.
G. M. Dykes Iron Works, Inc.
John Hassall, Inc.
Walter K. Jaros, Aircrafters
United Shoe Machinery Corp.

NAVIGATION EQUIPMENT, GROUND

Advance Industries, Inc.
Analogue Controls, Inc.
Bendix Aviation Corp., York Div.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
*CRAIG SYSTEMS, INC.
*DATA-CONTROL SYSTEMS INC.
Davidson Mfg. Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Communications, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
F. W. Fecker, Inc.. Sub.—American Optical Co.
Garde Mfg. Co.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
*HAYWARD SCIENTIFIC GLASS CORP.
Hazeltine Electronics Div.-Hazeltine Corp.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Librascope Inc.
Link Aviation, Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Servo Corp. of America
Stromberg-Carlson, Electronics Div.
Technical Oil Tool Corp.
Telectro Industries Corp.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

NEEDLES, DIAMOND

Advance Industries, Inc.
Bergen Carbide Co.
Moser Jewel Co.

NEEDLES, METAL

Moser Jewel Co.

NEEDLES, STEEL

Moser Jewel Co.
Nuclear Corp. of America, Inc.

NUCLEAR MANIPULATORS

*AMERICAN MACHINE & FOUNDRY CO.
*ANTON ELECTRONIC LABS., INC.
General Nuclear Corp.
Mechanical Div.-General Mills, Inc.
Nuclear Corp. of America, Inc.
Telectro Industries Corp.

NUCLEAR METERS, COUNTING RATE

*ANTON ELECTRONIC LABS., INC.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
*COOPER DEVELOPMENT CORP.
Gerard G. Leeds Co., Inc.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Stanley Aviation Corp.
Systron Corp.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

NUCLEAR METERS, DOSIMETER

*AMERICAN MACHINE & FOUNDRY CO.
*ANTON ELECTRONIC LABS., INC.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Terminal Radio Corp.

NUCLEAR METERS, NUCLEAR RADIATION

*ANTON ELECTRONIC LABS., INC.
Baird-Atomic, Inc.
*COOPER DEVELOPMENT CORP.
Jordan Electronics, Div.-Victoreen Instrument Co.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Riggs Nucleonic Co.
Stanley Aviation Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wunderlich Radio Co.

NUCLEAR PROCESSORS, CATACLYSTIC FLOW RATE

Gerard G. Leeds Co., Inc.
Nuclear Corp. of America, Inc.

NUCLEAR RADIOACTIVE STAK

Davidson Mfg. Co.

OPTICAL EQUIPMENT AND SPECIALTIES

Acme Industrial Co.
American Optical Co., Instrument Div.
Atlantic Research Corp.
Baird-Atomic, Inc.
*BAUSCH & LOMB OPTICAL CO.
Buhl Optical Co.
Cameron Surgical Specialty Co.
Coleman Engrg. Co., Inc.
Consolidated Electrodynamics Corp.
Eastman Kodak Co.
Engrg. Developments, Inc.
J. W. Fecker, Inc., Sub.-American Optical Co.
General Railway Signal Co.
General Scientific Equipment Co.
Goodyear Aircraft Corp.
Hammett Electric Co.
*HAYWARD SCIENTIFIC GLASS CORP.
Jones & Lamson Machine Co.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Librascope Inc.
Link Aviation, Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Nemeth, Inc.
O & S Research, Inc.
Optomechanisms, Inc.
Pacific Universal Products Corp.
Perkin Elmer Corp.
Process & Instruments
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Zenith Opitcal Laboratory
Wollensak Optical Co.

OVENS, CRYSTAL

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Bulova Watch Co., Electronics Div.
Clark Crystal Co.
Cox & Co., Inc.
Elm Mfg. Co. Inc.
Hycon Eastern Inc.
Herrick L. Johnston, Inc.
James Knights Co., The
Lavoie Labs., Inc.
Manson Laboratories, Inc.
McCoy Electronics Co.
Premier Research Laboratories, Inc.
United States Dynamics Corp.
Wright Electronics Inc.

OVENS, ENVIRONMENTAL TESTING

Aircraft Standards, Inc.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
J. P. DeVine Mfg. Co.
Grieve-Hendry Co., Inc.
Guardite Co., Div. of American-Marietta Co.
Herrick L. Johnston, Inc.
R. C. Mahon Co., The
Murphy & Miller Inc.
*RYAN INDUSTRIES
Tenney Engrg., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.

OVENS, INFRA-RED DRYING

R. C. Mahon Co., The
Miskella Infra-Red Co., The
*RYAN INDUSTRIES
Science House, Inc.

OVENS, TEMPERATURE CONTROLLED

Acme Electric Heating Co.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
Bulova Watch Co., Electronics Div.
Devilbiss Co., The
Eisler Engrg. Co., Inc.
Grieve-Hendry Co., Inc.
E. Vernon Hill & Co.
A. F. Holden Co., The
North Atlantic Industries, Inc.
Litton Engrg. Labs.
R. C. Mahon Co., The
Manson Laboratories, Inc.
McCoy Electronics Co.
Papesch & Kolstad, Inc.
*PHOENIX PRODUCTS CO.
Premier Research Laboratories, Inc.
Resdel Engrg. Corp.
*RYAN INDUSTRIES
Selas Corp. of America
Telectro Industries Corp.
Tenney Engrg., Inc.
United States Dynamics Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
*WESTINGHOUSE ELECTRIC CORP.

PACKAGING, ELECTRONIC EQUIPMENT, SERVICE ONLY

American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Bendix Aviation Corp., York Div.
Calco Corp., Aircraft Div.
Champion Co., The
Cleveland Metal Specialties Co.
Coleman Engrg. Co., Inc.
Conco Engrg. Works
*COOPER DEVELOPMENT CORP.
Dayton Aircraft Products, Inc.
Dwyer Engrg. Co., Inc.
*ECKOL PACKAGING CO.
Falstrom Co.
Ludwig Honold Mfg. Co.
Link Aviation, Inc.
J. A. Maurer, Inc.
Modglin Co. Inc.
Motorola Inc., Military Marketing Div.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Ralph M. Parsons Co., The, Electronics Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
*RHEEM MFG. CO., ELECTRONICS DIV.
Telectro Industries Corp.
Thompson Products, Inc.
Topper Mfg. Co., Inc.

PACKAGING MATERIALS

Alden Products Co.
Applied Design Co.
Bekins Industrial Packaging
Champion Co., The
Crystal-X Corp.
Dayton Aircraft Products, Inc.
Driaire, Inc.
*ECKOL PACKAGING CO.
Fidelity Chemical Products Corp.
Ludwig Honold Mfg. Co.
Humidial Co.
Muckle Mfg. Co.
Nopco Chemical Co.

PANELS, WOOD AND PLYWOOD

*ECKOL PACKAGING CO.
Met-L-Wood Corp.
Modglin Co. Inc.
Spartan Marking Corp.
Wells Industries Corp.

PEDESTALS

Ainslie Corp.
Antlab Inc.
Champion Airquipment Inc.
G. W. Galloway Co.
Mechanical Div.-General Mills, Inc.
Mendelsohn Speedgun Co., Inc.
Reeves Instrument Corp.
United Mfg. Co., The

PHOTOGRAPHIC EQUIPMENT

Bar-Ray Products, Inc.
Beattie-Coleman, Inc.
Benson-Lehner Corp.
Charles Beseler Co.
Cameraflex Corp.
Davidson Mfg. Co.
Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
General Photo Products Co., Inc.
Graflex, Inc.
*HAYWARD SCIENTIFIC GLASS CORP.
Heiland Div.—Minneapolis-Honeywell Regulator Co.
Hershey Mfg. Co.
Huber Industries, Inc.
Librascope Inc.
Logetronics Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Optomechanisms Inc.
Peerless Photo Products Inc.
Telectro Industries Corp.
Vought Co.
Wollensak Optical Co.

PHOTOGRAPHIC MATERIALS, SPECTROGRAPHIC INSTRUMENTS

*BAUSCH & LOMB OPTICAL CO.
Benson-Lehner Corp.
Librascope Inc.
Mast Development Co., Inc.
Merix Chemical Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Optomechanisms Inc.
Peerless Photo Products Inc.
United Carbon Products Co.
Vought Co.

PHOTOGRAPHIC MATERIALS, X-RAY FILMS

Eastman Kodak Co.
Graflex, Inc.
Merix Chemical Co.

PICKUPS, INDUSTRIAL

Atlantic Research Corp.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Ultradyne, Inc.

PLIERS

Eyelet Tool Co. Inc.
Ideal Industries, Inc.
Kelsey-Hayes Co.
Owatonna Tool Co.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.

PLYWOOD MANUFACTURERS

United States Plywood Corp.

PLYWOOD AND METAL, BONDED

Bar-Ray Products, Inc.
Met-L-Wood Corp.
Skydine Inc.
United States Plywood Corp.

POTS, SOLDERING

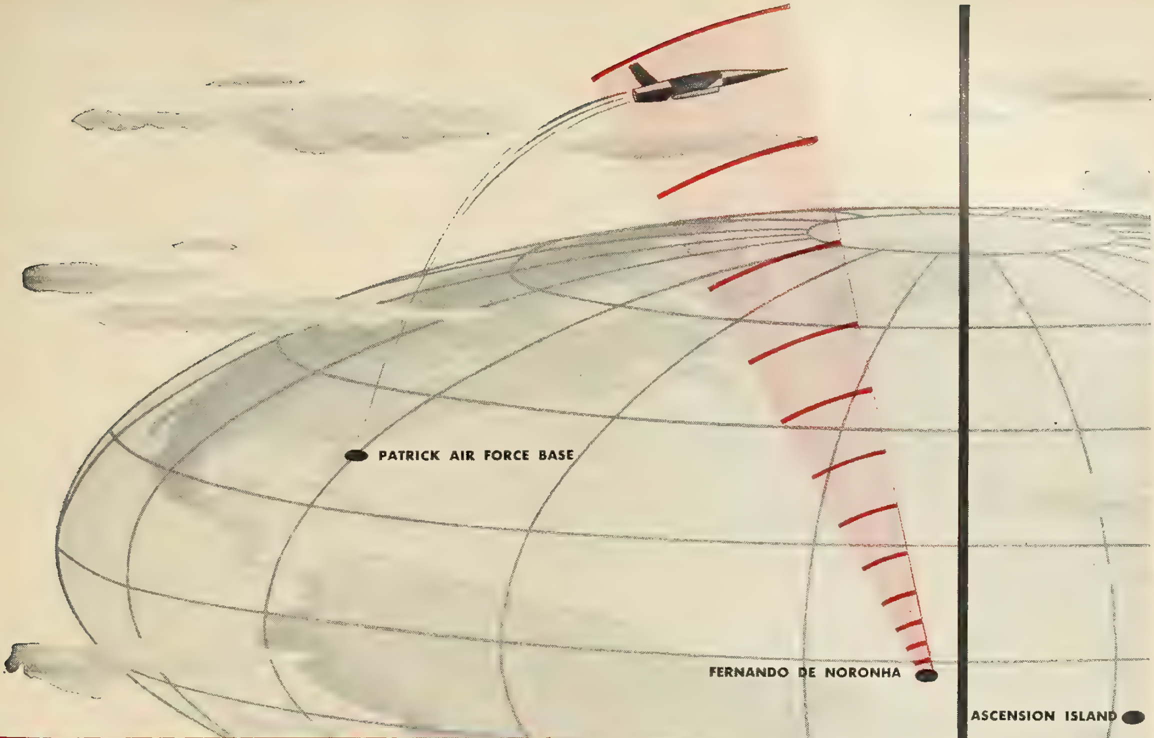
Acme Electric Heating Co.
Alden Systems Co.
Dittmore-Freimuth Corp.
Eisler Engrg. Co., Inc.
Narda Ultrasonics Corp., The
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.

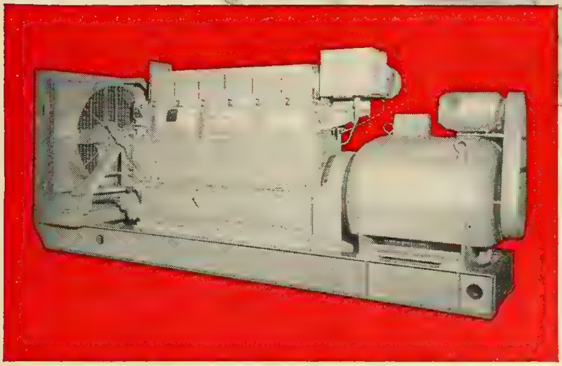
POTS & TANKS, HEATING

Acme Electric Heating Co.
General Electric Co., Apparatus Sales Div.
Leach Corp.
*RYAN INDUSTRIES
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.
Wells Industries Corp.

POWER SOURCES, GROUND

Aero-Test Equipment Co., Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
American Welding & Mfg. Co., The
Consolidated Diesel Electric Corp., Test Equip. Div.
Joe Davidson & Associates
Eagle-Picher Co., The
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Green Rectifier Co.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
*INTERELECTRONICS CORP.
International Research Associates
*KAHN & CO., INC.
Kurz & Root Co.
Leach Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motordyne Inc.
New York Air Brake Co., The, Watertown Div.
Northwestern Electric Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
D. W. Onan & Sons Inc.





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*PACKARD-BELL ELECTRONICS CORP.
Patterson, Moos Div.-Universal Winding Co., Inc.
Rivett Lathe & Grinder Inc.
Rucker Co., The
Sel-Rex Corp.
Sun Electric Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
Wells Industries Corp.
*WESTINGHOUSE AIRBRAKE CO., INDUST. PRODUCTS DIV.
Wickfield, Inc.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

Electric

Aero-Test Equipment Co., Inc.
Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Bendix Aviation Corp., York Div.
Consolidated Diesel Electric Corp., Test Equip. Div.
Eagle-Picher Co., The
Eaton Mfg. Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gray & Huleguard, Inc.
Green Rectifier Co.
*GREER HYDRAULICS, INC.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Haskell Engrg. & Supply Co.
*INTERELECTRONICS CORP.
*KAHN & CO., INC.
Kurz & Root Co.
Lee Electric & Mfg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motordyne Inc.
Northwestern Electric Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
D. W. Onan & Sons Inc.
Opad Electric Co.
*PACKARD-BELL ELECTRONICS CORP.
Patterson, Moos Div.-Universal Winding Co., Inc.
Ready Power Co., The
Sun Electric Corp.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Talley Corp., The
Telectro Industries Corp.
Ultradyne, Inc.
Varo Mfg. Co.
Wells Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wickfield, Inc.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

Hydraulic

Aero-Test Equipment Co., Inc.
Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Coleman Engrg. Co., Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
*CORNELIUS CO., THE
Dynex, Inc.
*EASTERN INDUSTRIES, INC.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
Gremco, Inc.
Hi-Shear Rivet Tool Co.
Hydra-Power Corp.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
*KAHN & CO., INC.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
New York Air Brake Co., The, Watertown Div.
Owatonna Tool Co.
Rivett Lathe & Grinder Inc.
Rucker Co., The
Schaffer Air Industries, Inc.
Sun Electric Corp.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div.-Sundstrand Machine Tool Co.
Thompson Products, Inc.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Wells Industries Corp.
Wickfield, Inc.

Mechanical

Aero-Test Equipment Co., Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Consolidated Diesel Electric Corp., Test Equip. Div.
Eaton Mfg. Co., Inc., Fredric Flader Div.
G. W. Galloway Co.
*GREER HYDRAULICS, INC.
Gremco, Inc.
Haskell Engrg. & Supply Co.
*KAHN & CO., INC.
Sun Electric Corp.
Talley Corp., The
Technical Oil Tool Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
Wells Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wickfield, Inc.
Winder Aircraft Corp. of Fla.

Pneumatic

Aero-Test Equipment Co., Inc.
Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Bendix Products Div.-Bendix Aviation Corp.
Consolidated Diesel Electric Corp., Test Equip. Div.
*CORNELIUS CO., THE
Gardner-Denver Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
*KAHN & CO., INC.
Walter Kidde & Co., Inc., Aviation Div.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Rucker Co., The
Schaffer Air Industries, Inc.
Sun Electric Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Wells Industries Corp.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.

Prime Movers

Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Canoga Corp. of California
Eaton Mfg. Co., Inc., Fredric Flader Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Kurz & Root Co.
Macks Trucks, Inc., Govt. Div.
Motordyne Inc.
Varo Mfg. Co.
Wells Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.
*WHITE DIESEL ENGINE DIV.-THE WHITE MOTOR CO.

POWER SUPPLIES

Airborne Accessories Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
Amerac Inc.
American Electronics, Inc.
American Research & Mfg. Corp.
American Television & Radio Co.
Arnoux Corp.
*BEHLMAN ENGRG. CO.
Avion Div.-ACF Industries, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
J. H. Bunnell & Co.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
Davenport Mfg. Co.
Del Electronics Corp.
Eagle-Picher Co., The
Eicor Div.-F. L. Jacobs Co.
Electric Eye Equipment Co.
Electronic Assembly Co., Inc.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engineered Magnetics, Div.-Gulton Industries, Inc.
Ferranti Electric Inc.
John Fluke Mfg. Co., Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Instrument Corp., Defense Products Div.
General Photo Products Co., Inc.
Goslin Electric & Mfg. Co.
Gray & Huleguard, Inc.
Green Rectifier Co.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
Highland Engrg. Co.
*INTERELECTRONICS CORP.
International Research Associates
Jack & Heintz, Inc.
Jordan Electronics, Div.-Victoreen Instrument Co.
*KAHN & CO., INC.
Keystone Products Co.
Kurz & Root Co.
Lambda Electronics Corp.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
*MOTOR GENERATOR CORP.
Motordyne Inc.
Motorla Inc., Military Marketing Div.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NJE Corp.
North Hills Electric Co., Inc.
Northwestern Electric Co.
D. W. Onan & Sons Inc.
Optimized Devices, Inc.
Owen Labs., Inc.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Potter Co., The
Reeves Instrument Corp.
Resdel Engrg. Corp.
Royal Industries, Inc.
Sel-Rex Corp.
Solar Aircraft Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Electric Co., The
Task Corp.
Telectro Industries Corp.
Televiso Corp.
Tel-Instrument Electronics Corp.
Trans Electronics, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.
Winder Aircraft Corp. of Fla.

a-c

AMP Inc.
Adler Electronics, Inc.
Airborne Accessories Corp.
Airdesign Corp.
Louis Allis Co., The
American Electronics, Inc.
American Television & Radio Co.
Amplifier Corp. of America
Arnoux Corp.
Baird-Atomic, Inc.
*BEHLMAN ENGRG. CO.
Bendix Aviation Corp., Red Bank Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Bracke-Seib X-Ray Co., Inc.
Burroughs Corp.
Celco-Constantine Engrg. Laboratories Co.
Centronix Inc.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Del Electronics Corp.
Eicor Div.-F. L. Jacobs Co.
Electronic Techniques, Inc.
Engineered Magnetics, Div.-Gulton Industries, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Georator Corp.
Goslin Electric & Mfg. Co.
Gray & Huleguard, Inc.
Green Rectifier Co.
*GREER HYDRAULICS, INC.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
*INTERELECTRONICS CORP.
International Research Associates
Jack & Heintz, Inc.
Jordan Electronics, Div.-Victoreen Instrument Co.
Kearfott Co., Inc.
Kurz & Root Co.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Master Specialties Co.
Mercury Electronic Co.

Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
***MOTOR GENERATOR CORP.**
Motordyne Inc.
Motoresearch Co.
Motorola Inc., Military Marketing Div.
Multi-Amp Corp.
Munston Mfg. & Service Inc.
NJE Corp.
North Hills Electric Co., Inc.
Northwestern Electric Co.
Opad Electric Co.
Peschel Electronics, Inc.
Philco Corp., Government & Industrial Divs.
Potter Co., The
Power Sources, Inc.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
Sangamo Electric Co.
Saratoga Industries
Servomechanisms, Inc., Mechatrol Div.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Electric Co., The
Talley Corp., The
Task Corp.
Telectro Industries Corp.
Televiso Corp.
Tel-Instrument Electronics Corp.
Terado Co.
Trans Electronics, Inc.
Transistor Devices Inc.
Ultradyne, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wave Particle Corp.
***WESTINGHOUSE ELECTRIC CORP.**
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.
Winder Aircraft Corp. of Fla.

Computer

Acme Electric Corp.
Advance Industries, Inc.
Louis Allis Co., The
American Television & Radio Co.
Arnoux Corp.
Autonetics, Div.-North American Aviation, Inc.
Avion Div., ACF Industries, Inc.
Baird-Atomic, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Celco-Constantine Engrg. Laboratories Co.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Davenport Mfg. Co.
Dressen-Barnes Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Assembly Co., Inc.
Electronic Engrg. Co. of California
Engineered Magnetics, Div.-Gulton Industries, Inc.
Ferranti Electric Inc.
Fidelity Instrument Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Nuclear Corp.
Goodyear Aircraft Corp.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
***INTERELECTRONICS CORP.**
International Research Associates
Jordan Electronics, Div.-Victoreen Instrument Co.
Keystone Products Co.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Master Specialties Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Model Rectifier Corp.
Motordyne Inc.
NJE Corp.
North Hills Electric Co., Inc.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Opad Electric Co.
Peschel Electronics, Inc.
George A. Philbrick Researches, Inc.
Plastic Capacitors, Inc.
Radiation Counter Labs., Inc.
Reeves Instrument Corp.
Saratoga Industries
Solar Aircraft Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Trans Electronics, Inc.
Transistor Devices Inc.
Universal Electronics Co.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

d-c

Acme Electric Corp.
Adler Electronics, Inc.
Airborne Accessories Corp.
Airborne Instruments Lab., Inc.
Aircraft Products Div.-Cline Electric Mfg. Co.
Airdesign Corp.
Allegany Instrument Co., Inc.
Louis Allis Co., The
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
American Electronics, Inc.
American Television & Radio Co.
Amplifier Corp. of America
Arnoux Corp.
Baird-Atomic, Inc.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Bracke-Seib X-Ray Co., Inc.
California Computer Products
Celco-Constantine Engrg. Laboratories Co.
Centronix Inc.
Chicago Div., American Bosch Arma Corp.
Christie Electric Corp.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***COOPER DEVELOPMENT CORP.**
Davenport Mfg. Co.
Joe Davidson & Associates
Del Electronics Corp.
Dressen-Barnes Corp.
Eagle-Picher Co., The
Eicor Div.-F. L. Jacobs Co.
Electro Products Labs., Inc.
Electronic Assembly Co., Inc.
Electronic Engrg. Co. of California
Electronic Measurements Co., Inc.
Electronic Techniques, Inc.
Engineered Magnetic Div.-Gulton Industries, Inc.
Fairfield Engineering Corp.
Ferranti Electric Inc.
Fidelity Instrument Corp.
John Fluke Mfg. Co., Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
General Photo Products Co., Inc.
General Railway Signal Co.
Georator Corp.
Goslin Electric & Mfg. Co.
Gray & Huleguard, Inc.
Green Rectifier Co.
***GREER HYDRAULICS, INC.**
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hagan Chemicals & Controls, Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
***INTERELECTRONICS CORP.**
International Research Associates
Jack & Heintz, Inc.
Jordan Electronics, Div.-Victoreen Instrument Co.
***KAHN & CO., INC.**
Kearfott Co., Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Kurz & Root Co.
Lambda Electronics Corp.
Lee Electric & Mfg. Co.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Manson Laboratories, Inc.
Master Specialties Co.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
***MOTOR GENERATOR CORP.**
Motordyne Inc.
Motoresearch Co.
Motorola Inc., Military Marketing Div.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NJE Corp.
North Hills Electric Co., Inc.
Northwestern Electric Co.
Opad Electric Co.
Optimized Devices, Inc.
Owen Labs., Inc.
***PACKARD-BELL ELECTRONICS CORP.**
Patterson, Moos Div.-Universal Winding Co., Inc.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Potter Co., The
Power Sources, Inc.
Reeves Instrument Corp.
Reflectone Corp., The
Resdel Engrg. Corp.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Royal Industries, Inc.
Ryan Aeronautical Co.
Sanford Miller Co.
Saratoga Industries
Schauer Mfg. Corp.
Sel-Rex Corp.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Superior Electric Co., The
Stanley Aviation Corp.
Talley Corp., The
Telectro Industries Corp.
Terado Co.
Trans Electronics, Inc.
Transistor Devices Inc.
Ultradyne, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wave Particle Corp.
***WESTINGHOUSE ELECTRIC CORP.**
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.
Winder Aircraft Corp. of Fla.

Emergency, Mobile

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
American Electronics, Inc.
Barker Sales Co.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Frank R. Cook Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gremco, Inc.
Hammett Electric Co.
***INTERELECTRONICS CORP.**
International Research Associates
Jack & Heintz, Inc.
Keystone Products Co.
Kurz & Root Co.
***MOTOR GENERATOR CORP.**
Motordyne Inc.
NJE Corp.
D. W. Onan & Sons Inc.
Opad Electric Co.
Peschel Electronics, Inc.
Sun Electric Corp.
Telectro Industries Corp.
Terado Co.
Thompson Products, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.
Winder Aircraft Corp. of Fla.

400 Cps

Advance Industries, Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Aircraft Products Div.-Cline Electric Mfg. Co.
Louis Allis Co., The
American Electronics, Inc.
Amplifier Corp. of America
Arnoux Corp.
Autonetics, Div.-North American Aviation, Inc.
Avion Div., ACF Industries, Inc.
***BEHLMAN ENGRG. CO.**
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Celco-Constantine Engrg. Laboratories Co.
Consolidated Electrodynamics Corp.
Joe Davidson & Associates
Dressen-Barnes Corp.
Eicor Div.-F. L. Jacobs Co.
Electronic Assembly Co., Inc.
Electronic Techniques, Inc.
Engineered Magnetics, Div.-Gulton Industries, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Georator Corp.
Goslin Electric & Mfg. Co.
Gray & Huleguard, Inc.
Green Rectifier Co.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
Hoover Electric Co.
***INTERELECTRONICS CORP.**
International Research Associates
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kearfott Co., Inc.
Kurz & Root Co.
Lambda Electronics Corp.
Gerard G. Leeds Co., Inc.
Master Specialties Co.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
***MOTOR GENERATOR CORP.**
Motordyne Inc.
Motoresearch Co.
NJE Corp.
Northwestern Electric Co.
Opad Electric Co.
Owen Labs., Inc.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Potter Co., The
Power Sources, Inc.
Reeves Instrument Corp.
Resdel Engrg. Corp.

R[illegible] Industries Inc.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Electric Co., The
Task Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Thompson Products, Inc.
Trans Electronics, Inc.
Ultradyne, Inc.
Universal Electronics Co.
Varo Mfg. Co.
Vibration Research Labs., Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wincharger Electric Corp.
Winder Aircraft Corp. of Fla.

High Voltage

Amp Inc.
Adler Electronics, Inc.
Advance Industries, Inc.
Alto Scientific Co., Inc.
Autonetics, Div.-North American Aviation, Inc.
Axler Associates Inc.
Baird-Atomic, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Bracke-Seib X-Ray Co., Inc.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
*COOPER DEVELOPMENT CORP.
Davenport Mfg. Co.
Del Electronics Corp.
Dressen-Barnes Corp.
Eicor Div.-F. L. Jacobs Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
John Fluke Mfg. Co., Inc.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Hammett Electric Co.
Hamner Electronics Co., Inc.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
*KAHN & CO, Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Motordyne Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NJE Corp.
North Hills Electric Co., Inc.
Opad Electric Co.
Peschel Electronics, Inc.
Potter Co., The
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Saratoga Industries
Sel-Rex Corp.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
Televiso Corp.
Tempo Instrument Inc.
Trans Electronics, Inc.
Varo Mfg. Co.
Wave Particle Corp.
Winder Aircraft Corp. of Fla.

Klystron

Aircom Inc.
Alto Scientific Co., Inc.
Bendix Aviation Corp., Red Bank Div.
Browning Laboratories, Inc.
Demornay-Bonardi
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fidelity Instrument Corp.
Geisler Labs.
Goslin Electric & Mfg. Co.
Hammett Electric Co.
*INTERELECTRONICS CORP.
Manson Laboratories, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Opad Electric Co.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.

Lighting Equipment

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Georator Corp.
Gremco, Inc.
Hammett Electric Co.
*INTERELECTRONICS CORP.
Hershey Mfg. Co.
*KAHN & CO., INC.
Telectro Industries Corp.
Terado Co.

Magnetic

Advance Industries, Inc.
American Research & Mfg. Corp.
Arnoux Corp.
Avion Div., ACF Industries, Inc.
Bendix Aviation Corp., Red Bank Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Burroughs Corp.
Canoga Corp. of California
Cedar Engrg. Div.-Control Data Corp.
Celco-Constantine Engrg. Laboratories Co.
Christie Electric Corp.
D & R, Ltd.
Dressen-Barnes Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Ferranti Electric Inc.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
*INTERELECTRONICS CORP.
Keystone Products Co.
Gerard G. Leeds Co., Inc.
NJE Corp.
Opad Electric Co.
Power Sources, Inc.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.

Microwave

Aircom Inc.
Alto Scientific Co., Inc.
Amerac Inc.
Baird-Atomic, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Canoga Corp. of California
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Demornay-Bonardi
Geisler Labs.
General Communication Co.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
J-V-M Microwave Co.
Manson Laboratories, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
NJE Corp.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Opad Electric Co.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Universal Electronics Co.
Varo Mfg. Co.
Wave Particle Corp.
Wickes Engrg. & Construction Co. Inc.

Radar

Advance Industries, Inc.
Alto Scientific Co., Inc.
Bendix Aviation Corp., Red Bank Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Canoga Corp. of California
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Dressen-Barnes Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Geisler Labs.
General Communication Co.
General Instrument Corp., Defense Products Div.
Goodyear Aircraft Corp.
Goslin Electric & Mfg. Co.
Hallamore Electronics Co.
J-V-M Microwave Co.
Manson Laboratories, Inc.
Motordyne Inc.
NJE Corp.
*PACKARD-BELL ELECTRONICS CORP.
Philco Corp., Government & Industrial Divs.
Plastic Capacitors, Inc.
Power Sources, Inc.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Televiso Corp.
Trans Electronics, Inc.
Varo Mfg. Co.
Wave Particle Corp.
Westbury Electronics Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Wickes Engrg. & Construction Co. Inc.

Regulated

Acme Electric Corp.
Adler Electronics, Inc.
Aircom Inc.
Aircraft Products Div.-Cline Electric Mfg. Co.
Airdesign Corp.
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Amplifier Corp. of America
Arnoux Corp.
Atlantic Research Corp.
Autonetics, Div.-North American Aviation, Inc.
Avion Div.-ACF Industries, Inc.
Axler Associates Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
J. H. Bunnell & Co.
Burroughs Corp.
Canoga Corp. of California
Celco-Constantine Engrg. Laboratories Co.
Centronix Inc.
Christie Electric Corp.
Computer Engrg. Associates, Inc.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
Davenport Mfg. Co.
Joe Davidson & Associates
Dressen-Barnes Corp.
Eicor Div.-F. L. Jacobs Co.
Electronic Assembly Co., Inc.
Electronic Measurements Co., Inc.
Electronic Techniques, Inc.
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
Endevco Corp.
Ferranti Electric Inc.
Fidelity Instrument Corp.
John Fluke Mfg. Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
General Railway Signal Co.
Goodyear Aircraft Corp.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Gremco, Inc.
Hallamore Electronics Co.
Hamner Electronics Co., Inc.
E. Vernon Hill & Co.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
*INTERELECTRONICS CORP.
International Research Associates
Jordan Electronics, Div.-Victoreen Instrument Co.
Keystone Products Co.
Kurz & Root Co.
Lambda Electronics Corp.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Manson Laboratories, Inc.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Motordyne Inc.
Motoresearch Co.
Motorola Inc., Military Marketing Div.
Multi-Amp Corp.
NJE Corp.
North Hills Electric Co., Inc.
Northwestern Electric Co.
Opad Electric Co.
Optimized Devices, Inc.
Orbitran Co., Inc.
Owen Labs., Inc.
Philco Corp., Government & Industrial Divs.
Plastic Capacitors, Inc.
Polarad Electronics Corp.
Potter Co., The
Power Sources, Inc.
Radiation Counter Labs., Inc.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Saratoga Industries
Sel-Rex Corp.
Southwestern Industrial Electronics Co.
Standard Electronics Div.-Radio Engrg. Labs., Inc.
Superior Electric Co., The
Stanley Aviation Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Televiso Corp.
Trans Electronics, Inc.
Transistor Devices Inc.
Ultradyne, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wave Particle Corp.
Westbury Electronics Inc.
Wickes Engrg. & Construction Co. Inc.

Seals

Bendix Aviation Corp., Red Bank Div.
Gits Brothers Mfg. Co.
Telectro Industries Corp.
Universal Electronics Co.

Transmitter

Alto Scientific Co., Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Beta Electric Corp.
J. H. Bunnell & Co.
Communications Co.
Computer Engrg. Associates, Inc.
*COOPER DEVELOPMENT CORP.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
*INTERELECTRONICS CORP.
Lambda Electronics Corp.
Model Rectifier Corp.
Motordyne Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
NJE Corp.
Opad Electric Co.
*PACKARD-BELL ELECTRONICS CORP.
Patterson, Moos Div.-Universal Winding Co., Inc.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Ryan Aeronautical Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
Trans Electronics, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wunderlich Radio Co.

Transistor

Acme Electric Corp.
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Avion Div., ACF Industries, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bergen Labs.
Bogue Electric Mfg. Co.
Communications Co.
Computer Engrg. Associates, Inc.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Consolidated Avionics Corp.
Dressen-Barnes Corp.
Dunlap Electronics, Inc.
Eicor Div.-F. L. Jacobs Co.
Electro Products Labs., Inc.
Electronic Assembly Co., Inc.
Electronic Measurements Co., Inc.
Electronic Techniques, Inc.
Fairfield Engineering Corp.
Ferranti Electric Inc.
John Fluke Mfg. Co., Inc.
General Instrument Corp., Defense Products Div.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
*INTERELECTRONICS CORP.
International Research Associates
Jordan Electronics, Div.-Victoreen Instrument Co.
Kay Electric Co.
Lambda Electronics Corp.
Lane Electronics Mfg. Corp.
Gerard G. Leeds Co., Inc.
P. R. Mallory & Co. Inc.
Master Specialties Co.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Missile Engrg. Products, Inc.
Model Rectifier Corp.
Motordyne Inc.
Motorola Inc., Military Marketing Div.
NJE Corp.
North Hills Electric Co., Inc.
Opad Electric Co.
Orbitran Co., Inc.
Owen Labs., Inc.
Plastic Capacitors, Inc.
Power Sources, Inc.
Saratoga Industries
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Thompson Products, Inc.
Trans Electronics, Inc.
Transistor Devices Inc.
Ultradyne, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Universal Electronics Co.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Westbury Electronics Inc.
Wickes Engrg. & Construction Co. Inc.

Variable

AMP Inc.
Acme Electric Corp.
Advance Industries, Inc.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Avion Div., ACF Industries, Inc.
*BEHLMAN ENGRG. CO.
Bendix Aviation Corp., Red Bank Div.
Beta Electric Corp.
Bogue Electric Mfg. Co.
Bracke-Seib X-Ray Co., Inc.
Consolidated Avionics Corp.
Davenport Mfg. Co.
Del Electronics Corp.
Dressen-Barnes Corp.
Dunlap Electronics, Inc.
Eicor Div.-F. L. Jacobs Co.
Electro Products Labs., Inc.
Electronic Assembly Co., Inc.
Electronic Measurements Co., Inc.
Electro-Tech Equipment Co.
Fairfield Engineering Corp.
General Nuclear Corp.
Green Rectifier Co.
Gremco, Inc.
Hammett Electric Co.
Hamner Electronics Co., Inc.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
International Research Associates
*KAHN & CO., INC.
Lambda Electronics Corp.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Mercury Electronics Co.
Motordyne Inc.
Multi-Amp Corp.
NJE Corp.
North Hills Electric Co., Inc.
Northwestern Electric Co.
Opad Electric Co.
Optimized Devices, Inc.
Owen Labs., Inc.
*PACKARD-BELL ELECTRONICS CORP.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Potter Co., The
Radiation Counter Labs., Inc.
Resdel Engrg. Corp.
Saratoga Industries
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Superior Electric Co., The
Telectro Industries Corp.

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Transitor Devices Inc.
Universal Electronics Co.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wickes Engrg. & Construction Co. Inc.

Voltage Regulated

Acme Electric Corp.
Aircom Inc.
Aircraft Products Div.-Cline Electric Mfg. Co.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Arnoux Corp.
Atlantic Research Corp.
Avion Div., ACF Industries, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bergen Labs.
Bogue Electric Mfg. Co.
Christie Electric Corp.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Davenport Mfg. Co.
Dressen-Barnes Corp.
Dunlap Electronics Inc.
Eicor Div.-F. L. Jacobs Co.
Electronic Assembly Co., Inc.
Electronic Measurements Co., Inc.
Electronic Techniques, Inc.
Electro-Tech Equipment Co.
Ferranti Electric Inc.
Fidelity Instrument Corp.
John Fluke Mfg. Co., Inc.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
Hamner Electronics Co., Inc.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
*INTERELECTRONICS CORP.
International Research Associates
Jordan Electronics, Div.-Victoreen Instrument Co.
Keystone Products Co.
Kurz & Root Co.
Lambda Electronics Corp.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories Inc.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Modglin Co. Inc.
*MOTOR GENERATOR CORP.
Motordyne Inc.
Motoresearch Co.
Multi-Amp Corp.
NJE Corp.
Northwestern Electric Co.
Opad Electric Co.
Orbitran Co., Inc.
Owen Labs., Inc.
George A. Philbrick Researches, Inc.
Plastic Capacitors, Inc.
Potter Co., The
Power Sources, Inc.
Process & Instruments
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Saratoga Industries
Schauer Mfg. Corp.
Sel-Rex Corp.
Southwestern Industrial Electronics Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Superior Electric Co., The
Stanley Aviation Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Televiso Corp.
Thompson Products, Inc.
Trans Electronics, Inc.
Transistor Devices Inc.
Ultradyne, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Universal Electronics Co.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wave Particle Corp.
Westbury Electronics Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wincharger Corp.

PRESSES, METAL FORMING

Acromark Co., The
American Brake Shoe Co.
E. W. Bliss Co.
Cincinnati Milling Machine Co., The
Cleveland Crane & Engrg. Co., The
Connector Corp.
Danly Machine Specialties, Inc.
Denison Engrg. Div., American Brake Shoe Co.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
Kelsey-Hayes Co.
Lake Erie Machinery Corp.
Loewy-Hydropress, Div.-Baldwin-Lima-Hamilton
Modglin Co. Inc.
Philips & Davies Inc.
Roovers-Lotson Corp.
Rotex Punch Co., Inc.
T. W. & C. B. Sheridan Co.
F. J. Stokes Corp.
Walsh Press & Die Co.

PRESSURIZATION UNITS

Anderson, Greenwood & Co.
Associated Testing Labs., Inc.
Cardox Corp.
Carleton Aviation Co., Inc.
Champion Pneumatic Machinery Co.
*CORNELIUS CO., THE
J. P. DeVine Mfg. Co.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Haskell Engrg. & Supply Co.
*KAHN & CO., INC.
McCormick Selph Associates
Propellex Chemical Corp.
*RYAN INDUSTRIES
Stearns-Roger Mfg. Co.
Thompson Products, Inc.
Wells Industries Corp.

PROCESSING EQUIPMENT, MOTION PICTURE

J. A. Maurer, Inc.
Optomechansims Inc.
Telectro Industries Corp.

PUBLIC ADDRESS SYSTEMS

Bliss Electronic Corp.
Browning Laboratories, Inc.
Dunlap Electronics, Inc.
Executone, Inc.
General Scientific Equipment Co.
*INTERELECTRONICS CORP.
Motorola Inc., Military Marketing Div.
Setchell-Carlson Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Thompson Products, Inc.

PUMPS

Air Products, Inc.
Applied Dynamics Corp.
Bart Mfg. Corp.
Bell & Gossett Co.
Bendix Products Div., Bendix Aviation Corp.
Blackmer Pump Co.
Champion Pneumatic Machinery Co.
Consolidated Electrodynamics Corp.
Cooper Alloy Corp.
*CORNELIUS CO., THE
Food Machinery & Chemical Corp., Ordnance Div.
Herrick L. Johnston, Inc.
Joyce Cridland Co., The
Denison Engrg. Div., American Brake Shoe Co.
Dynex, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gray Co., Inc.
*GREER HYDRAULICS, INC.
Harman Equipment Co.
*BYRON JACKSON PUMPS, INC., SUB.—BORG-WARNER CORP.
Hastings Plastics, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Lawrence Pumps Inc.
Gerard G. Leeds Co., Inc.
A. Y. McDonald Mfg. Co.
NRC Equipment Corp.
Nash Engrg. Co., The
National Airoil Burner Co.
New York Air Brake Co., The, Watertown Div.
W. H. Nichols Co.
Owatonna Tool Co.
Pennsylvania Pump & Compressor Co.
Pyles Industries, Inc.
Milton Roy Co.
Schutte & Koerting Co.
Sier-Bath Gear & Pump Co., Inc.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Superior Air Products Co.
Task Corp.
Thompson Products, Inc.
Veeco Vacuum Corp.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.

PUNCH PRESSES

Associated Co., Inc.
E. W. Bliss Co.
Danly Machine Specialties, Inc.
Denison Engrg. Div., American Brake Shoe Co.
Rotex Punch Co., Inc.
Wales Strippit Co., Unit of Houdaille Industries, Inc.
Walsh Press & Die Co.
Wiedmann Machine Co.

PUNCHES

A&P Metal Products Mfg. Corp.
Acromark Co., The
M. A. Ford Mfg. Co. Inc.
Wales Strippit Co., Unit of Houdaille Industries, Inc.
Wiedmann Machine Co.

RACKS

Aerodex, Inc.
Alad Aluminum Ladder Corp.
Alden Products Co.
Calcor Corp., Aircraft Div.
G. M. Dykes Iron Works, Inc.
Falstrom Co.
Heldor Mfg. Co., Inc.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Luria Engrg. Co.
Pic Design Corp., Sub—Benrus Watch Co., Inc.
Pitman Mfg. Co.
United Mfg. Co., The

Aging, Vacuum Tube & Transistor

Anchor Specialty Mfg. Co. Inc.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Muckle Mfg. Co.
Opad Electric Co.
Vacuum Tube Products Co. Inc.

Cabinet

Aerodex, Inc.
Alden Products Co.
Alden Systems Co.
Applied Design Co.
*CRAIG SYSTEMS, INC.
Cromer Mfg. & Engrg., Inc.
J. P. DeVine Mfg. Co.
Falstrom Co.
General Railway Signal Co.
*KAHN & CO., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Muckle Mfg. Co.
Paul & Beekman, Inc.
Peterson & Neville Inc.
Premier Metal Products Co.
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Western Arc Welding, Inc.
Wilcox Electric Co., Inc.
Wyco Metal Products

Disc Storage

Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Paul & Beekman, Inc.
*WASHINGTON ALUMINUM CO., INC.

Equipment

A&P Metal Products Mfg. Corp.
Calcor Corp., Aircraft Div.
Champion Airquipment Inc.
*CRAIG SYSTEMS, INC.
Cromer Mfg. & Engrg., Inc.
Econoweld Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Luria Engrg. Co.
Paul & Beekman, Inc.
Premier Metal Products Co.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
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Mounting & Relay

Alden Products Co.
Calcor Corp., Aircraft Div.
*CRAIG SYSTEMS, INC.
General Railway Signal Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Model Rectifier Corp.
Muckle Mfg. Co.
Peterson & Neville Inc.
Premier Metal Products Co.
*WASHINGTON ALUMINUM CO., INC.
Wilcox Electric Co., Inc.

RECTIFIER POWER UNITS

Airborne Accessories Corp.
Aircraft Products Div.-Cline Electric Mfg. Co.
American Television & Radio Co.
Bogue Electric Mfg. Co.

Christie Electric Corp.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
General Railway Signal Co.
Green Rectifier Co.
Gremco, Inc.
Hammett Electric Co.
Macarr, Inc.
Motordyne Inc.
Motoresearch Co.
Opad Electric Co.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Power Sources, Inc.
Reeves Instrument Corp.
Sanford Miller Co.
Sarkes Tarzian, Inc.
Schauer Mfg. Corp.
Sel-Rex Corp.
Southwestern Industrial Electronics Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
Telkor, Inc.
United States Dynamics Corp.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.

REFRIGERATION EQUIPMENT, GROUND

Air Products, Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Aireco, Inc.
American Air Filter Co., Defense Products Div.
American Electronics, Inc.
Associated Testing Labs., Inc.
Bar-Ray Products, Inc.
Bell & Gossett Co.
Cal-Air Conditioning Co.
Dunham-Bush Inc.
*EASTERN INDUSTRIES, INC.
Ellis & Watts Products, Inc.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Greenbrier Instruments Inc.
Gremco, Inc.
C. G. Hokanson Co., Inc.
Hussmann Aircraft Div.
Herrick L. Johnston, Inc.
Missimers Inc.
D. W. Onan & Sons Inc.
Ready Power Co., The
Stratos, Div.-Fairchild Engine & Airplane Corp.
Tenney Engrg., Inc.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.

REGULATORS

Accessory Products Co., Div.-Textron Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Air Speed Tool Co.
American Electronics, Inc.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
*CORNELIUS CO., THE
Cubic Corp.
Cutler-Hammer Inc.
*EASTERN INDUSTRIES, INC.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*INTERELECTRONICS CORP.
Jack & Heintz, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Lear, Inc.
*WALLACE O. LEONARD, INC.
Marotta Valve Corp.
Parker Aircraft Co.
Milton Roy Co.
Vibration Research Labs., Inc.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.

Air

Accessory Products Co., Div.-Textron Inc.
Altair Inc.
ARO Equipment Corp., The
Bridgwater Machine Co.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Clary Dynamics
Henry G. Dietz Co., Inc., The
Fischer & Porter Co.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gray Co., Inc.
*GREER HYDRAULICS, INC.
Hoke Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Walter Kidde & Co., Inc. Aviation Div.
M. C. Mfg. Co.
Marotta Valve Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Superior Pneumatic & Mfg., Inc.
Vinson Mfg. Co. Inc.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Air Pressure

Accessory Products Co., Div.-Textron Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Air Speed Tool Co.
Altair Inc.
ARO Equipment Corp., The
Bridgwater Machine Co.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Clary Dynamics
*CORNELIUS CO., THE
Devilbiss Co., The
Henry G. Dietz Co., Inc., The
Electric Auto-Lite Co., The
Fischer & Porter Co.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
Gray Co., Inc.
*GREER HYDRAULICS, INC.
Hagan Chemicals & Controls, Inc.
Hoke Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Walter Kidde & Co., Inc., Aviation Div.
Lear, Inc.
*WALLACE O. LEONARD, INC.
M. C. Mfg. Co.
Marotta Valve Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Scientific Instrument Co.
Stratos, Div.-Fairchild Engine & Airplane Corp.
Superior Pneumatic & Mfg., Inc.
Vap-Air Div., Vapor Heating Corp.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Cable Tension

W. C. Dillon & Co., Inc.
Progressive Research & Development Co., Inc.

Electric Frequency, A. C. Generators

Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
D & R, Ltd.
Electric Regulator Corp.
Fidelity Instrument Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Lumen, Inc.
Motordyne Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Wacline, Inc.
Wickes Engrg. & Construction Co. Inc.

Electric Frequency, Inverters

Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
Electric Regulator Corp.
General Electric Co., Apparatus Sales Div.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Lumen, Inc.
Motordyne Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wickes Engrg. & Construction Co. Inc.

Electric Voltage, A. C. Generators

Aircraft Products Div.-Cline Electric Mfg. Co.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
Curtiss-Wright Corp., Electronics Div.
Electric Regulator Corp.
Fidelity Instrument Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Helipot Corp.
Hertner Electric Co., The
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
Instrument Motors
*INTERELECTRONICS CORP.
Jack & Heintz, Inc.
Kurz & Root Co.
Gerard G. Leeds Co., Inc.
Lumen, Inc.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Motordyne Inc.
Ryan Aeronautical Co.
Telectro Industries Corp.
Ultradyne, Inc.
Varo Mfg. Co.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wickes Engrg. & Construction Co. Inc.

Electric Voltage, D. C. Generators

Aircraft Products Div.-Cline Electric Mfg. Co.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
Cubic Corp.
Electric Regulator Corp.
Ferranti Electric Inc.
Fidelity Instrument Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hertner Electric Co., The
Instrument Motors
*INTERELECTRONICS CORP.
Jack & Heintz, Inc.
Gerard G. Leeds Co., Inc.
Lumen, Inc.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Motordyne Inc.
Ryan Aeronautical Co.
Telectro Industries Corp.
Ultradyne, Inc.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.
Wickes Engrg. & Construction Co. Inc.

Electric Voltage, Inverters

American Research & Mfg. Corp.
Arnoux Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
Electric Regulator Corp.
Ferranti Electric Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Jack & Heintz, Inc.
Motordyne Inc.
Ryan Aeronautical Co.
Thompson Products, Inc.
Ultradyne, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wickes Engrg. & Construction Co. Inc.

Fluid Flow

Accessory Products Co., Div.-Textron Inc.
Acoustica Associates, Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Auburn Spark Plug Co., Inc.
Brooks Rotameter Co.
CDC Control Services, Inc.
Devilbiss Co., The
Dynamic Controls Corp.
*EASTERN INDUSTRIES, INC.
Fischer & Porter Co.
Futurecraft Corp.
Gray Co., Inc.
Hagan Chemicals & Controls, Inc.
Hays Mfg. Co.
Walter J. Hyatt Co., The
Koehler Aircraft Products Co., Inc.
*WALLACE O. LEONARD, INC.
Marotta Valve Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Reaction Motors, Inc.
Research Controls
*UNITED AIRCRAFT PRODUCTS, INC.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.

Hydraulic Pressure

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Altair Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Arkwin Industries, Inc.
Bridgwater Machine Co.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Clary Dynamics
Dynex, Inc.
*EASTERN INDUSTRIES, INC.
Electric Auto-Lite Co., The
Fischer & Porter Co.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gray Co., Inc.
*GREER HYDRAULICS, INC.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Koehler Aircraft Products Co., Inc.
*WALLACE O. LEONARD, INC.
M. C. Mfg. Co.
Marotta Valve Corp.
New York Air Brake Co., The, Watertown Div.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div. Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Reserach Controls
Scientific Instrument Co.
Sun Electric Corp.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Liquid Level

Accessory Products Co., Div.-Textron Inc.
Acoustica Associates, Inc.
Auburn Spark Plug Co., Inc.
Brooks Rotameter Co.
CDC Control Services, Inc.
Cutler Hammer Inc.
Fischer & Porter Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hagan Chemicals & Controls, Inc.
Koehler Aircraft Products Co., Inc.
*WALLACE O. LEONARD, INC.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Narda Ultrasonics Corp., The
Parker Aircraft Co.
*PENBERTHY MFG. CO.
Pioneer-Central Div., Bendix Aviation Corp.
Progressive Research & Development Co., Inc.
Research Controls
Sun Electric Corp.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Oxygen

Accessory Products Co., Div.-Textron Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Air Products, Inc.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Aro Equipment Corp., The
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Clary Dynamics
Fischer & Porter Co.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Scientific Equipment Co.
Hoke Inc.
Leeds & Northrup Co.
*WALLACE O. LEONARD, INC.
Marotta Valve Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Oxygen Equipment & Service Co.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Puritan Compressed Gas Corp., Aviation Div.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Temperature

Barber-Colman Co.
Bogue Electric Mfg. Co.
CDC Control Services, Inc.
A. W. Cash Co.
Dynamic Controls Corp.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fischer & Porter Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hagan Chemicals & Controls, Inc.
Hallikainen Instruments
E. Vernon Hill & Co.
Leeds & Northrup Co.
Lumen, Inc.
Metals & Controls Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Parker Aircraft Co.
Philadelphia Scientific Glass Co.
Powers Regulator Co., The
Pyrometer Instrument Co., Inc.
Resdel Engrg. Corp.
Scientific Instrument Co.
*STEVENS MFG. CO., INC.
Thermo Electric Co., Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
United Control Corp.
Vap-Air Div., Vapor Heating Corp.
Vinson Mfg. Co. Inc.

Water Metering

All American Aircraft Products, Inc.
Bendix Products Div., Bendix Aviation Corp.
CDC Control Services, Inc.
Fischer & Porter Co.
Hallikainen Instruments
Research Controls
Milton Roy Co.
Whittaker Controls, Div.-Telecomputing Corp.

ROCKET LAUNCHING DEVICES

Aircraft Mechanics, Inc.
American Car & Foundry Div., ACF Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Anderson, Greenwood & Co.
Applied Design Co.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Basic Tool Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
Champion Airquipment Inc.
*COOPER DEVELOPMENT CORP.
Danly Machine Specialties, Inc.
Dittmore-Freimuth Corp.
G. M. Dykes Iron Works, Inc.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Federal Machine Co. Inc.
Food Machinery & Chemical Corp., Ordnance Div.
*FRUEHAUF TRAILER CO.
G. W. Galloway Co.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Goodyear Aircraft Corp.
*GREER HYDRAULICS, INC.
Gremco, Inc.
Hahn & Clay
Hallamore Electronics Co.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Loewy-Hydropress, Div.—Baldwin-Lima-Hamilton
Lukens Steel Co.
Luria Engrg. Co.
McDowell Co. Inc.
Modglin Co. Inc.
Nuclear Products-Erco, Div.—ACF Industries, Inc.
Pacific Coast Engrg. Co.
Propellex Chemical Corp.
Republic Aviation Corp., Guided Missiles Div.
Royal Industries, Inc.
Solar Aircraft Co.
Standard Armament Inc.
Stanley Aviation Corp.
Talley Corp., The
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
Turbo Dynamics Corp.
United Mfg. Co., The
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Washington Technological Associates Inc.
Wells Industries Corp.
Wheland Co., The
Wickfield, Inc.

SAFETY EQUIPMENT

*HAWS DRINKING FAUCET CO.

SAWS

Black & Decker Mfg. Co., The
Capewell Mfg. Co.
Dremel Mfg. Co.
Simonds Saw & Steel Co.
L. S. Starrett Co., The

SCALES, OSCILLOSCOPE

Hickok Electrical Instrument Co., The
Sohl Co., The

SCOOPS

Black & Decker Mfg. Co., The
Hastings Plastics Inc.
Modglin Co. Inc.
Republic Aviation Corp., Guided Missiles Div.
Smith-Morris Corp.

SCREW DRIVERS

*BILLINGS & SPENCER CO., THE
Gardner-Denver Co.
Kelsey-Hayes Co.
Reed & Prince Mfg. Co.
Richmont, Inc.
United Shoe Machinery Corp.
J. H. Williams Co.

SEALS

Advanced Products Co., The
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Electrical Industries, Div.-Philips Electronics, Inc.
Fluorocarbon Co. Inc., The
Fusite Corp.
Geisler Labs.
Green, Tweed & Co.
Joclin Mfg. Co.
Walter Lee Chemical Corp.
St. Marys Carbon Co.
Schlegel Mfg. Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Sylvania Electric Products Inc., Parts Div.
U. S. Hammered Piston Ring Co., Inc.
Wave Particle Corp.

Metal-to-Glass

Auburn Spark Plug Co., Inc.
L. L. Constantin & Co.
Corning Glass Works
Dayton Mfg. Co., Inc.
Demornay-Bonardi
Edgerton, Germeshausen & Grier, Inc.
Electrical Industries, Div.-Philips Electronics, Inc.
Fusite Corp.
Geisler Labs.
Gilmore Industries Inc.
La Pointe Industries Inc.
McCormick Selph Associates
Pacific Universal Products Corp.
Schlegel Mfg. Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Sylvania Electric Products Inc., Parts Div.
U. S. Hammered Piston Ring Co., Inc.
Vacuum Tube Products Co. Inc.
Wave Particle Corp.
X-Pando Corp.

Missile

Advanced Products Co., The
Automatic & Precision Mfg. Co.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Connecticut Hard Rubber Co., The
D. S. D. Mfg. Co., The
Emerson Plastics Corp.
Green, Tweed & Co.
Joclin Mfg. Co.
Kennametal Inc.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.

Oil

Advanced Products Co., The
Auburn Mfg. Co., The
Automatic & Precision Mfg. Co.
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
D. S. D. Mfg. Co., The
Dumont Aviation Associates
Emerson Plastics Corp.
General Cable Corp.
Gits Brothers Mfg. Co.
*GRAPHITE METALLIZING CORP.
Green, Tweed & Co.
Kasar Mfg. & Distributing Co., Inc.
La Pointe Industries Inc.
Walter Lee Chemical Corp.
Magnetic Seal Corp.
St. Marys Carbon Co.
*UNITED AIRCRAFT PRODUCTS, INC.
U. S. Hammered Piston Ring Co., Inc.
Vibra Seal Corp.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.

Pipe Joint

Advanced Products Co., The
Cardox Corp.
Crane Packing Co.
D. S. D. Mfg. Co., The
Emerson Plastics Corp.
General Cable Corp.
Green, Tweed & Co.
Joclin Mfg. Co.
Walter Lee Chemical Corp.
Linear, Inc.
National Engrg. Products, Inc.
Parker-Hannifin Corp.
Smooth-On Mfg. Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
Vibra Seal Corp.
X-Pando Corp.

Pump

Auburn Mfg. Co., The
Chicago-Allis Mfg. Corp.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Crane Packing Co.
Emerson Plastics Corp.
General Cable Corp.
Gits Brothers Mfg. Co.
Green, Tweed & Co.
Joclin Mfg. Co.
Walter Lee Chemical Corp.
Linear, Inc.
Magnetic Seal Corp.
Ohio Carbon Co., The
St. Marys Carbon Co.
***UNITED AIRCRAFT PRODUCTS, INC.**
U. S. Hammered Piston Ring Co., Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

SEPARATORS, OIL

Air-Maze Corp.
ARO Equipment Corp., The
Briggs Filtration Co., The
Cuno Engrg. Corp., The
General Cable Corp.
***GREER HYDRAULICS, INC.**
Harman Equipment Co.
Parker Aircraft Co.
Milton Roy Co.
Selas Corp. of America
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Warner Lewis Co., Div.-Fram Corp.

SEPARATION DEVICES

Air Products, Inc.
Beckman & Whitley, Inc., Missile Products Div.
***COOPER DEVELOPMENT CORP.**
Electric Eye Equipment Co.
Eriez Mfg. Co.
General Cable Corp.
***GREER HYDRAULICS, INC.**
Harman Equipment Co.
McCormick Selph Associates
Mechanical Div.-General Mills, Inc.
Stanley Aviation Corp.
Talco Engrg. Co., The
Washington Technological Associates Inc.
Wickfield, Inc.
Winchester—West. Div.—Olin Mathieson Chem. Corp.

SHIMS, LAMINATED

***LAMINATED SHIM CO.**

SIGNALLING, DEVICES

Adler Electronics, Inc.
Allard Instrument Corp.
Beckman & Whitley, Inc., Missile Products Div.
Eagle Signal Corp.
General Railway Signal Co.
Graflex, Inc.
Kemlite Laboratories, Inc.
McCormick Selph Associates
Mechanical Div.-General Mills, Inc.
Milman Engrg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Optomechanisms Inc.
Propellex Chemical Corp.
Sohl Co., The
Stanley Aviation Corp.
Victory Engineering Corp.

SLIDES, INDUSTRIAL

***GRANT PULLEY & HARDWARE CORP.**

SNIPS

H. K. Porter Inc.

SOLDER POTS

Acme Electric Heating Co.
Alcar Instruments, Inc.
Alden Systems Co.
Anchor Metal Co. Inc.
Dittmore-Freimuth Corp.
Eisler Engrg. Co., inc.
General Electric Co., Apparatus Sales Div.
Massa Labs., Inc.
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.

SOLDERING GUNS

Acoustica Associates, Inc.
Alcar Instruments, Inc.
Anchor Metal Co. Inc.
Eisler Engrg. Co., Inc.
Electro-Tech Equipment Co.
P. Wall Mfg. Co.
Zephyr Mfg. Co. Inc.

SOLDERING IRONS

Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Huber Industries, Inc.
Ideal Industries, Inc.
National Specialties Co., Inc.
Selas Corp. of America
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.
P. Wall Mfg. Co.
Zephyr Mfg. Co. Inc.

SOLDERING IRON STANDS

Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.
P. Wall Mfg. Co.

SOLDERING IRON TIPS

Ideal Industries, Inc.
P. R. Mallory & Co. Inc.
National Specialties Co., Inc.
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.
P. Wall Mfg. Co.
Wenco Mfg. Co.

SOLENOID VALVES

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Arkwin Industries, Inc.
Automatic Switch Co.
Bendix Products Div., Bendix Aviation Corp.
Clary Dynamics
Consolidated Radio Products Co.
Coppus Engrg. Corp.

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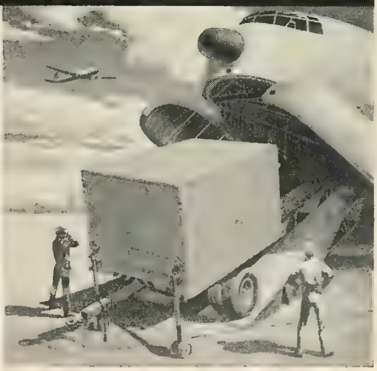

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Dynamic Controls Corp.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Tech Equipment Co.
Engelberg Huller Co., Inc.
Futurecraft Corp.
Galland Henning Nopak Div.
General Controls Co.
Gray & Huleguard, Inc.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Johnson Electronics Inc.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
***KOONTZ-WAGNER ELECTRIC CO., INC.**
Gerard G. Leeds Co., Inc.
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Jas. P. Marsh Corp.
Mechanical Air Controls, Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Oil-Rite Corp.
Ozone Metal Products Corp.
Pacific Div.—Bendix Aviation Corp.
Parker Aircraft Co.
Pierce Governor Co., Inc., The
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
***REPUBLIC MFG. CO.**
Skinner Electric Valve Div., The Skinner Chuck Co.
Tactair Valve Div.-Aircraft Products Co.
***UNITED AIRCRAFT PRODUTCS, INC.**
***VALCOR ENGRG. CORP.**
Veeco Vacuum Corp.
Vickers Inc., Div.-Sperry Rand
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.

SOLENOIDS, CONTROL

Aero Supply Mfg. Co., Inc.
Automatic Switch Co.
Bendix Products Div., Bendix Aviation Corp.
Cannon Electric Co.
Comar Electric Co.
James Cunningham Son & Co., Inc.
Electric Auto-Lite Co., The
Electrical Windings, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engelberg Huller Co., Inc.
General Electric Co., Apparatus Sales Div.
Walter J. Hyatt Co., The
***KOONTZ-WAGNER ELECTRIC CO., INC.**
Leetronics, Inc.
Mar Vista Engrg. Co.
Mara Electronics Inc.
J. A. Maurer, Inc.
E. V. Naybor Labs., Inc.
Parker Aircraft Co.
Joseph Pollak Corp.
Robot Appliances Inc.
Telectro Industries Corp.
***UITED AIRCRAFT PRODUCTS, INC.**
Varo Mfg. Co.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Wacline, Inc.
Weston Hydraulics, Ltd.

SOLENOIDS, LINEAR

Aero Supply Mfg. Co., Inc.
Automatic Switch Co.
Bendix Products Div., Bendix Aviation Corp.
Cannon Electric Co.
James Cunningham Son & Co., Inc.
Cutler-Hammer Inc.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Tech Equipment Co.
Walter J. Hyatt Co., The
***KOONTZ-WAGNER ELECTRIC CO., THE**
Mar Vista Engrg. Co.
Mara Electronics, Inc.
J. A. Maurer, Inc.
Modelectric Products Corp.
E. V. Naybor Labs., Inc.
Parker Aircraft Co.
Pickering & Co., Inc.
Joseph Pollak Corp.
Ram Electronics Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Vibra Seal Corp.
Wacline, Inc.

SOLENOIDS, ROTARY

Bendix Products Div., Bendix Aviation Corp.
Cannon Electric Co.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
***KOONTZ-WAGNER ELECTRIC CO., INC.**
Leetronics, Inc.
G. H. Leland, Inc.
Magnuson Engineers, Inc.
Mar Vista Engrg. Co.
Mara Electronics, Inc.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
Parker Aircraft Co.
Telectro Industries Corp.
Varo Mfg. Co.
Wacline, Inc.
Wunderlich Radio Co.

SOLENOIDS, SUB-MINIATURE

Aerolite Electronics Corp.
Bendix Products Div., Bendix Aviation Corp.
Cannon Electric Co.
Comar Electric Co.
James Cunningham Son & Co., Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Elgin National Watch Co.
Walter J. Hyatt Co., The
Leetronics, Inc.
Mar Vista Engrg. Co.
Mara Electronics Inc.
J. A. Maurer, Inc.
Modelectric Products Corp.
John B. Moore Corp.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Vibra Seal Corp.
Wacline, Inc.

SOLVENTS

Cobehn, Inc.
Consolidated Radio Products Co.
Dennis Chemical Co.
General Cement Mfg. Co., Div.-Textron Inc.
Kano Labs.
London Chemical Co., Inc.
Mona Industries, Inc.
Trio Chemical Works, Inc.
Wye Industries

SOUND SYSTEMS, COMPLETE

American Electronics, Inc.
Chesapeake Instrument Corp.
Consolidated Radio Products Co.
Executone, Inc.
Magnasync Mfg. Co., Ltd.
J. A. Maurer, Inc.
Telectro Industries Corp.

SPEAKERS

Adance Industries, Inc.
Roflan Co., The
Setchell-Carlson Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
University Loudspeakers, Inc.
Wright Zimmerman, Inc.

SPLICING EQUIPMENT

Dittmore-Freimuth Corp.
Electromation Co.
Kinevox-Hallen
J. A. Maurer, Inc.
Optomechanisms Inc.

STAMPS, MARKING

Ackerman Gould Co.
Acromark Co., The
Jas. H. Matthews & Co.
Pryor Marking Products
Sohl Co., The
Transue & Williams Steel Forging Corp.

STARTERS

American Welding & Mfg. Co., The
Collins Engrg. Corp.
Cutler-Hammer Inc.
Electric Auto-Lite Co., The
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
McCormick Selph Associates
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.

STARTERS, PNEUMATIC

Accessory Controls & Equipment Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Consolidated Diesel Electric Corp., Test Equip. Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***GREER HYDRAULICS, INC.**
Hussmann Aircraft Div.
McCormick Selph Associates
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Thompson Products, Inc.
Wells Industries Corp.
***WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.**

STARTERS, ROCKET ENGINE

Consolidated Diesel Electric Corp., Test Equip. Div.
***COOPER DEVELOPMENT CORP.**
McCormick Selph Associates
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Propellex Chemical Corp.
Reaction Motors, Inc.
Rocketdyne Div., North American Aviation, Inc.
Thompson Products, Inc.

STARTING SYSTEMS & CONTROLS

Aircraft Products Div.-Cline Electric Mfg. Co.
American Electronics, Inc., Data-Tronics Div.
Consolidated Diesel Electric Corp., Test Equip. Div.
Electric Auto-Lite Co., The
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***GREER HYDRAULICS, INC.**
***HARTMAN ELECTRICAL MFG. CO., THE**
***KAHN & CO., INC.**
Marquardt Aircraft Co.
Reaction Motors, Inc.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Thompson Products, Inc.
Vickers Inc., Div.-Sperry Rand

STILLS & DEMINERALIZERS

Barnstead Still & Demineralizer Co.
J. P. DeVine Mfg. Co.
Stearns-Roger Mfg. Co.
Wappler, Inc.

STIMULATORS

ACF Industries, Inc., Advanced Products Div.
***AMERICAN MACHINE & FOUNDRY CO.**
Bendix Products Div., Bendix Aviation Corp.
General Electric Co., Missile & Ordnance Systems Dept. (Vt.)
Grass Instrument Co.
Guardian Electric Mfg. Co.
Lane Electronics Mfg. Corp.
Link Aviation, Inc.
Stromberg-Carlson, Electronics Div.
Wappler, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wells Industries Corp.

STORAGE CONTAINERS

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc.
American Car & Foundry Div., ACF Industries, Inc.
American Pipe & Steel Corp.
American Welding & Mfg. Co., The
Applied Design Co.
Bar-Ray Products Inc.
Basic Tool Industries, Inc.
Bekins Industrial Packaging
Buffalo Metal Container Corp.
Butler Mfg. Co.
Cardox Corp.
Champion Co., The
Conco Engrg. Works
***CRAIG SYSTEMS, INC.**
***ECKOL PACKAGING CO.**
Food Machinery & Chemical Corp., Ordnance Div.
***FRUEHAUF TRAILER CO.**
G. W. Galloway Co.
Gremco, Inc.
Heldor Mfg. Co., Inc.
Ingersoll Kalamazoo Div., Borg-Warner Corp.
Joclin Mfg. Co.
Herrick L. Johnston, Inc.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
Lukens Steel Co.
Luria Engrg. Co.
R. C. Mahon Co., The
Modglin Co. Inc.
Muckle Mfg. Co.
Nuclear Products—Erco, Div.-ACF Industries, Inc.
Olympic Plastics Co., Inc.
Opelika Welding, Machine & Supply Inc.
Paul & Beekman, Inc.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CO.**
Royal Industries, Inc.
***RYAN INDUSTRIES**
Science House, Inc.
Seamless Products Co., Inc.
Skydyne Inc.
Smith-Morris Corp.
Solar Aircraft Co.
Stearns-Roger Mfg. Co.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
Washington Technological Associates Inc.
Wells Industries Corp.
Zero Mfg. Co.

STOOLS & BENCHES

Alden Systems Co.
Ballymore Co.
Challenge Machinery Co., The
Gremco, Inc.
Standard Pressed Steel Co.
*WASHINGTON ALUMINUM CO., INC.

STORAGE UNITS

(Liquid Oxygen, Liquid Nitrogen Low Temperature)

*HOFMAN LABS., INC.

SWITCHES

*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.

TAILPIPES, JET ENGINE

ACF Industries, Inc., Advanced Products Div.
Basic Tool Industries, Inc.
Bridgwater Machine Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
*LYCOMING DIV., AVCO MFG. CORP.
Parish Pressed Steel, Div.-Dana Corp.
*PHOENIX PRODUCTS CO.
Portland Copper & Tank Works Inc.
*RHEEM MFG. CO., AIRCRAFT DIV.
Ryan Aeronautical Co.
Smith-Morris Corp.
Solar Aircraft Co.
*UNITED AIRCRAFT PRODUCTS, INC.
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

TANKS

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
American Welding & Mfg. Co., The
Basic Tool Industries, Inc.
Champion Co., The
Cromer Mfg. & Engrg., Inc.
J. P. DeVine Mfg. Co.
G. M. Dykes Iron Works, Inc.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hahn & Clay
Ludwig Honold Mfg. Co.
Joclin Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
R. C. Mahon Co., The
Henry & Miller Industries, Inc.
Opelika Welding, Machine & Supply Inc.
*RHEEM MFG. CO., AIRCRAFT DIV.
Royal Industries, Inc.
Ryan Aeronautical Co.
*RYAN INDUSTRIES
Smith-Morris Corp.
Solar Aircraft Co.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.
Westholt Mfg. Co.

Auxiliary

ACF Industries, Inc., Advanced Products Div.
Basic Tool Industries, Inc.
Champion Co., The
Cromer Mfg. & Engrg., Inc.
G. W. Galloway Co.
Ludwig Honold Mfg. Co.
Hussmann Aircraft Div.
Joclin Mfg. Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
Henry & Miller Industries, Inc.
Opelika Welding, Machine, & Supply Inc.
Parish Pressed Steel, Div.-Dana Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
*RYAN INDUSTRIES
Smith-Morris Corp.
Solar Aircraft Co.
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Auxiliary Drop

ACF Industries, Inc., Advanced Products Div.
Basic Tool Industries, Inc.
Champion Co., The
Cromer Mfg. & Engrg., Inc.
G. W. Galloway Co.
Hussmann Aircraft Div.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
Henry & Miller Industries, Inc.
Parish Pressed Steel, Div.-Dana Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
*RYAN INDUSTRIES
Smith-Morris Corp.
Solar Aircraft Co.
Wells Industries Corp.
Westholt Mfg. Co.

Fuel

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Air Logistics Corp.
Air Products, Inc.
Buffalo Metal Container Corp.
Champion Co., The
Cromer Mfg. & Engrg., Inc.
Four Wheel Drive Auto Co., The
*FRUEHAUF TRAILER CO.
G. W. Galloway Co.
B. F. Goodrich Aviation Products
Hussmann Aircraft Div.
Joclin Mfg. Co.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Longren Aircraft Co., Inc.
Opelika Welding, Machine, & Supply Inc.
Parish Pressed Steel, Div.-Dana Corp.
Philips & Davies Inc.
Portland Copper & Tank Works Inc.
*RHEEM MFG. CO., AIRCRAFT DIV.
Ryan Aeronautical Co.
*RYAN INDUSTRIES
Shaw Metal Products Corp.
Solar Aircraft Co.
Stearns-Roger Mfg. Co.
*TRAILMOBILE INC.
*UNITED AIRCRAFT PRODUCTS, INC.
Warren Mfg. Div.-Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.
Westholt Mfg. Co.

Liquid Nitrogen

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Aro Equipment Corp., The
Champion Co., The
Cromer Mfg. & Engrg., Inc.
D. K. Mfg. Co.
G. W. Galloway Co.
B. F. Goodrich Aviation Products
Hahn & Clay
Herrick L. Johnston, Inc.
*HOFMAN LABS., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Opelika Welding, Machine, & Supply Inc.
Philips & Davies Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
*RHEEM MFG. CO., AIRCRAFT DIV.
Rocketdyne Div., North American Aviation, Inc.
Ronan & Kunzl, Inc.
*RYAN INDUSTRIES
Solar Aircraft Co.
Stearns-Roger Mfg. Co.
Superior Air Products Co.
Thompson Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.
Western Arc Welding, Inc.
Westholt Mfg. Co.

Liquid Oxygen

ACF Industries, Inc., Advanced Products Div.
Air Products, Inc.
Air Reduction Sales Co., Div.-Air Reduction Co., Inc.
Aro Equipment Corp., The
Champion Co., The
Clark-Aiken Co., The
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
*FRUEHAUF TRAILER CO.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
B. F. Goodrich Aviation Products
Hahn & Clay
Herrick L. Johnston, Inc.
*HOFMAN LABS., INC.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Opelika Welding, Machine, & Supply Inc.
Philips & Davies Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
Rocketdyne Div., North American Aviation, Inc.
Ronan & Kunzl, Inc.
Ronan & Kunzl, Inc., Cryogenic Div.
*RYAN INDUSTRIES
Solar Aircraft Co.
Stearns-Roger Mfg. Co.
Superior Air Products Co.
Thompson Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.
Western Arc Welding, Inc.
Westholt Mfg. Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

Liquified Gas Storage

ACF Industries, Inc., Advanced Products Div
Air Products, Inc.
Aro Equipment Corp., The
Clark Aiken Co., The
Cromer Mfg. & Engrg., Inc.
D K Mfg. Co.
*FRUEHAUF TRAILER CO.
Hahn & Clay
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Menasco Mfg. Co.
Opelika Welding, Machine, & Supply Inc.
Philips & Davies Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Portland Copper & Tank Works Inc.
Ronan & Kunzl, Inc.
Ronan & Kunzl, Inc., Cryogenic Div.
*RYAN INDUSTRIES
Solar Aircraft Co.
Stearns-Roger Mfg. Co.
Superior Air Products Co.
Weatherhead Co., The
Wells Industries Corp.
Westholt Mfg. Co.

Low Temperature

*HOFMAN LABS., INC.

Oil

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Buffalo Metal Container Corp.
Cromer Mfg. & Engrg., Inc.
Four Wheel Drive Auto Co., The
*FRUEHAUF TRAILER CO.
B. F. Goodrich Aviation Products
Hahn & Clay
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
*REGENT JACK MFG. CO., INC.
Ryan Aeronautical Co.
Shaw Metal Products Corp.
*TRAILMOBILE INC.
*UNITED AIRCRAFT PRODUCTS, INC.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Wells Industries Corp.

Self Sealing

*RHEEM MFG. CO., AIRCRAFT DIV.
Wells Industries Corp.

Transportation and Storage

ACF Industries, Inc., Advanced Products Div.
Acme Welding Div., The United Tool & Die Co.
Applied Design Co.
Buffalo Metal Container Corp.
Cardox Corp.
Champion Co., The
Foreman Mfg. Co.
Four Wheel Drive Auto Co., The
*FRUEHAUF TRAILER CO.
B. F. Goodrich Aviation Products
Hahn & Clay
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Nooter Corp.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Opelika Welding, Machine, & Supply Inc.
Portland Copper & Tank Works Inc.
*REGENT JACK MFG. CO., INC.
*RYAN INDUSTRIES
Seamless Products Co., Inc.
Stearns-Roger Mfg. Co.
*TRAILMOBILE INC.
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.

TENSIONS, COIL WINDING

Dial Products Co.

THERMAL CONDITIONING EQUIPMENT

Airtemp Construction, Div.-Chrysler Corp.
Dunham-Bush Inc.
General Electric Co., Apparatus Sales Div.
Herrick L. Johnston, Inc.
Missimers Inc.
Security Parachute Co.
United Control Corp.

THERMAL CONDUCTIVITY CELLS

Farnsworth Electronic Co., Div.-Int'l Telephone & Telegraph Corp.
Green Rectifier Co.
Industrial Instruments Inc.
Leeds & Northrup Co.
Parameters, Inc.
Process & Instruments
Victory Engineering Corp.

TOOLS

Capewell Mfg. Co.
Federal Machine Co. Inc.
Stevens Walden Inc.

Pneumatic Assembly

Alden Systems Co.
Aro Equipment Corp., The
Bendix Products Div., Bendix Aviation Corp.
Gardner-Denver Co.
Superior Pneumatic & Mfg., Inc.

Resistance Soldering

P. Wall Mfg. Co.
Zephyr Mfg. Co. Inc.

Thermal Soldering

P. Wall Mfg. Co.

Ultrasonic Soldering

Acoustica Associates, Inc.
Narda Ultrasonics Corp., The
Pioneer-Central Div., Bendix Aviation Corp.
Reeve Electronics, Inc.

Wire Wrapping

Gardner-Denver Co.
Topper Mfg. Co., Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.

TOROIDS

Acromag Inc.
Advance Industries, Inc.
Aerolite Electronics Corp.
American Research & Mfg. Corp.
***AMERICAN TUBE BENDING CO., INC.**
Bendix Aviation Corp., York Div.
Burnell & Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
D & R, Ltd.
Ferroxcube Corp. of America
Goslin Electric & Mfg. Co.
International Research Associates
Johnson Electronics Inc.
Keystone Products Co.
Magnavox Co., The
Magnetic Core Corp.
NYT Electronics, Inc.
North Hills Electric Co., Inc.
Precision, Inc.
Sioux Radio Products
Solar Aircraft Co.
Southwestern Industrial Electronics Co.
D. M. Steward Mfg. Co.
Televiso Corp.
Tensor Electric Development Co., Inc.
Topper Mfg. Co., Inc.
Varo Mfg. Co.
Westbury Electronics Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

TRACERS, SIGNAL

Feiler Engrg. & Mfg. Co.
Keystone Products Co.
Skiatron Electronics & Television Corp.
Tensor Electric Development Co., Inc.

TRANSFER EQUIPMENT

(Low Temperature, Liquid Oxygen & Nitrogen)
***HOFMAN LABS., INC.**

TRANSFORMERS

Acme Electric Corp.
Acro Products Co.
Advance Industries, Inc.
Airtron, Inc.
Arnoux Corp.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Consolidated Radio Products Co.
Cycle Transformer Corp.
Del Electronics Corp.
Eisler Engrg. Co., Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Epco Products Inc.
Ferranti Electric Inc.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hevi-Duty Electric Co.
***INTERELECTRONICS CORP.**
Lenkurt Electric Co., Inc.
Mara Electronics, Inc.
Microtran Co. Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ray Electronics Inc.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

Audio

Burnell & Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Electrical Windings, Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Ferranti Electric Inc.
Goslin Electric & Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
***INTERELECTRONICS CORP.**
Lenkurt Electric Co., Inc.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
New York Coal Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Sangamo Electric Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Superex Electronics Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub-Sperry Rand Corp.

Fly Back

Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Chicago Standard Transformer Corp.
Coil Co. of America
Mara Electronics, Inc.
J. J. Monaghan Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wright Zimmerman, Inc.

Foil Wound

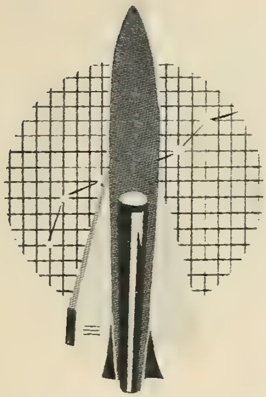
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Coil Co. of America
Consolidated Radio Products Co.
Cycle Transformer Corp.
Epco Products Inc.
Goslin Electric & Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Johnson Electronics Inc.
Lindberg Engrg. Co.
J. J. Monaghan Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Sterling Transformer Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.

General

Acme Electric Corp.
Advance Industries, Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Chicago Electronics Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Consolidated Radio Products Co.
Cycle Transformer Corp.
Del Electronics Corp.
Eisler Engrg. Co., Inc.
Electrical Windings, Inc.
Electro Engrg. Works
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Epco Products Inc.
Ferranti Electric Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Recitifier Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hevi-Duty Electric Co.
Hindle Transformer Co. Inc.
A. F. Holden Co., The
***INTERELECTRONICS CORP.**
Johnson Electronics Inc.
Keystone Products Co.
Kolton Electric Mfg. Co.
Lee Electriq & Mfg. Co.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Vargo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

High Voltage Power Supply

Airtron, Inc.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Bracke-Seib X-Ray Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Chicago Standard Transformer Corp.
Consolidated Radio Products Co.
Cycle Transformer Corp.
Del Electronics Corp.
Eisler Engrg. Co., Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ferranti Electric Inc.
Fugle-Miller Labs. Inc.
General Electric Co., Apparatus Sales Div.
General Precision Lab. Inc.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Hammett Electric Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hevi-Duty Electric Co.
Hindle Transformer Co. Inc.
***INTERELECTRONICS CORP.**
Keystone Products Co.
Kolton Electric Mfg. Co.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Peschel Electronics, Inc.
Ram Electronics Inc.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.



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how
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to
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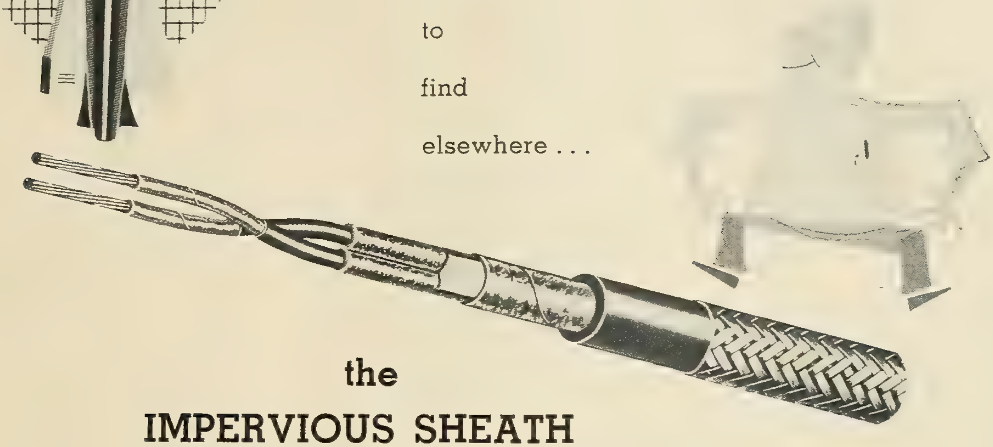
elsewhere . . .



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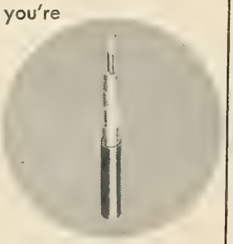

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Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs. Inc.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.
Wright Zimmerman, Inc.

Instrument

Acromag Inc.
Advance Industries Inc.
Arnoux Corp.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Coil Co. of America
Del Electronics Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electrical Windings, Inc.
Electro Engrg. Works.
Electronic Transformer Co., Inc.
General Electric Co., Apparatus Sales Div.
Hallamore Electronics Co.
Hammett Electric Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hevi-Duty Electric Co.
***INTERELECTRONICS CORP.**
Johnson Electronics Inc.
Keystone Products Co.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Motordyne Inc.
NYT Electronics, Inc.
National Coil Co.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Quick Charge Corp.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Intermediate Frequency

Airtron, Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Communications Co.
Consolidated Radio Products Co.
Epco Products Inc.
Fugle-Miller Labs. Inc.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
***INTERELECTRONICS CORP.**
Johnson Electronic Inc.
Keystone Products Co.
Lenkurt Electronic Co., Inc.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Redman Electronics Corp.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Vanguard Electronics Co.
Varo Mfg. Co.

Miniature

Acme Electric Corp.
Acro Products Co.
Advance Industries, Inc.
Airtron, Inc.
Bendix Aviation Corp., York Div.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Chicago Standard Transformer Corp.
Coil Co. of America
Consolidated Radio Products Co.
Cycle Transformer Corp.
Del Electronics Corp.
Electro Engrg. Works
Epco Products Inc.
Erie Resistor Corp.
Ferranti Electric Inc.
Fugle-Miller Labs. Inc.
General Precision Lab. Inc.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hevi-Duty Electric Co.
***INTERELECTRONICS CORP.**
Johnson Electronics Inc.
Keystone Products Co.
Mara Electronics Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Motordyne Inc.
NYT Electronics, Inc.
National Coil Co.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Superex Electronics Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

Power

Acme Electric Corp.
Advance Industries Inc.
Airtron, Inc.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Cycle Transformer Corp.
Del Electronics Corp.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Tech Equipment Co.
Ferranti Electric Inc.
General Electric Co., Apparatus Sales Div.
General Precision Lab. Inc.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Recitifier Co.
Hallamore Electronics Co.
Hammett Electric Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hevi-Duty Electric Co.
Hindle Transformer Co. Inc.
***INTERELECTRONICS CORP.**
Lindberg Engrg. Co.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Quick Charge Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Sangamo Electric Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Superior Electric Co., The
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub-Sperry Rand Corp.

TRANSMISSION LINE, WIRE & CABLE

Aluminum Co. of America
Belden Mfg. Co.
William Brand & Co., Inc.
Copperweld Steel Co., Wire & Cable Div.
Electronic Transformer Co., Inc.
General Cable Corp.
***INTERELECTRONICS CORP.**
International Electric Industries, Inc.
Plastoid Corp.
Prodelin Inc.
Rex Corp., The
Rome Cable Corp.
Terminal Radio Corp.
Times Wire & Cable Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Westbury Electronics Inc.
Western International Co.

TRANSMISSION LINES, MICROWAVE

Aircom Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Belden Mfg. Co.
Bendix Aviation Corp., York Div.
William Brand & Co., Inc.
Canoga Corp. of California
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
General Cable Corp.
Motorola Inc., Military Marketing Div.
Precision Tube Co., Inc.
Prodelin Inc.
Rador Design Corp.
Ryan Aeronautical Co.
Technical Appliance Corp.
Telechrome Mfg. Corp.
Terminal Radio Corp.
Uniwave, Inc.
Waveguide, Inc.
Westbury Electronics Inc.
Wunderlich Radio Co.

TRANSPORT UNITS

(Liquid Oxygen, Liquid Oxygen Highway, Liquid Nitrogen In Plant

***HOFMAN LABS., INC.**

TUBE PARTS

Aircraft Mechanics, Inc.
American Brass Co., The
***ANTON ELECTRONIC LABS., INC.**
Beaton & Corbin Mfg. Co., The
Champion Airquipment Inc.
Roll Formed Products Co.
Stainless Steel Products, Inc.
Sylvania Electric Products Inc., Parts Div.
Vibra Seal Corp.

TURNTABLES, SOUND EQUIPMENT

Advance Industries, Inc.
Hallamore Electronics Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Sohl Co., The
Telectro Industries Corp.
Walkefield Engrg. Co.

TURRETS, CAMERA

Cameraflex Corp.
J. W. Fecker, Inc., Sub.-American Optical Co.
***FLIGHT RESEARCH, INC.**
Hallamore Electronics Co.
Houston Fearless Corp.
J. A. Maurer, Inc.
Skiatron Electronics & Television Corp.

TWEETERS

Advance Industries, Inc.
Telectro Industries Corp.
Wright Zimmerman, Inc.

VACUUM ALUMINIZERS

Buhl Optical Co.
Consolidated Electrodynamics Corp., Rochester, Div.
Green Recitifier Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
NRC Equipment Corp.
National Research Corp.
Philips & Davies Inc.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.

VACUUM PUMPS

Aro Equipment Corp., The
Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
***CORNELIUS CO., THE**
***EASTERN INDUSTRIES, INC.**
Eisler Engrg. Co., Inc.
Green Rectifier Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
Joy Mfg. Co.
Gerard G. Leeds Co., Inc.
Leiman Brothers, Inc.
Litton Engrg. Labs.
NRC Equipment Corp.
National Research Corp.
Pesco Products Div.-Borg-Warner Corp.
Quincy Compressor Co.
F. J. Stokes Corp.
Veeco Vacuum Corp.

VACUUM SYSTEMS AND CONTROLS

Aro Equipment Corp., The
CDC Control Services, Inc.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester

*CORNELIUS CO., THE Div.
J. P. DeVine Mfg. Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Green Rectifier Co.
Guardite Co., Div. of American-Marietta Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
Herrick & Johnston, Inc.
Gerard G. Leeds Co., Inc.
Litton Engrg. Labs.
NRC Equipment Corp.
National Research Corp.
Process & Instruments
Research Appliance Co.
*RYAN INDUSTRIES
Stearns-Roger Mfg. Co.
United States Dynamics Corp.
Vacuum Research Co.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.
Warren Mfg. Div., Warren Brothers Roads Co.

VACUUM UNITS

Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
J. P. DeVine Mfg. Co.
Green Rectifier Co.
Guardite Co., Div. of American-Marietta Co.
High Vacuum Equipment Corp.
International Pump & Machine Works
Herrick L. Johnston, Inc.
Gerard G. Leeds Co., Inc.
Litton Engrg. Labs.
NRC Equipment Corp.
National Research Corp.
Process & Instruments
Research Appliance Co.
*RYAN INDUSTRIES
Stearns-Roger Mfg. Co.
Tenney Engrg., Inc.
Vacuum Research Co.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.
Warren Mfg. Div., Warren Brothers Roads Co.

VALVE GUIDES

Arkwin Industries, Inc.
Clary Dynamics
Hammel-Dahl, Div.-General Controls
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.

VALVE OPERATOR, ELECTRIC

Arkwin Industries, Inc.
Clary Dynamics
Conax Corp.
Cutler-Hammer Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammel-Dahl, Div.-General Controls
Kelsey-Hayes Co.
Mar Vista Engrg. Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Robbins Aviation, Inc.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.

VALVE OPERATOR, HYDRAULIC

Arkwin Industries, Inc.
CDC Control Services, Inc.
Clary Dynamics
Consolidated Electrodynamics Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammel-Dahl, Div.-General Controls
Hydra-Power Corp.
Hydromatics, Inc.
Kelsey-Hayes Co.
Kemp Aero Products, Div.-Kemp Inc.
Mar Vista Engrg. Co.
Oil-Dyne, Inc.
Progressive Research & Development Co., Inc.
Robbins Aviation, Inc.
Servomechanisms, Inc.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weighing & Control Components, Inc.
Weston Hydraulics, Ltd.

VALVES

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
A. K. Allen Co.
Automatic Switch Co.
Auto-Valve Inc.
Clary Dynamics
Consolidated Controls Corp.
*CORNELIUS CO., THE
Dumont Aircraft Fitting Co.
Engelberg Huller Co., Inc.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Herlo Engrg. Corp.
Hoefner Corp.
Hydromatics, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
*KAHN & CO., INC.
Kohler Co.
Ladish Co.
Lear, Inc.
Mar Vista Engrg. Co.
Jas. P. Marsh Corp.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Rivett Lathe & Grinder Inc.
Milton Roy Co.
Ryan Aeronautical Co.
*VALCOR ENGRG. CORP.
Vickery Co., The
Vinson Mfg. Co. Inc.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.

Accumulator Charging

A. K. Allen Co.
Arkwin Industries, Inc.
A. W. Cash Co.
Clary Dynamics
*GREER HYDRAULICS, INC.
Hammel-Dahl, Div.-General Controls
Hydra-Power Corp.
Hydromatics, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker-Hannifin Corp.
*REPUBLIC MFG. CO.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Acid

Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
Associated Valve Co.
Atkomatic Valve Co., Inc.
Clary Dynamics
Cooper Alloy Corp.
Dumont Aircraft Fitting Co.
Engelberg Huller Co., Inc.
Futurecraft Corp.
G. W. Galloway Co.
General Controls Co.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hills-McCanna Co.
Hydromatics, Inc.
James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
La Pointe Industries Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
Lear, Inc.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Milton Roy Co.
Thompson Products, Inc.
*VALCOR ENGRG. CORP.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

Acid Resistant

Aero Supply Mfg. Co., Inc.
Arkwin Industries, Inc.
Associated Valve Co.
Atkomatic Valve Co., Inc.
Automatic Switch Co.
Carleton Aviation Co., Inc.
Clary Dynamics
Cooper Alloy Corp.
Dumont Aircraft Fitting Co.
Engelberg Huller Co., Inc.
Fischer & Porter Co.
Futurecraft Corp.
G. W. Galloway Co.
General Controls Co.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hills-McCanna Co.
Hoke Inc.
Hydromatics, Inc.
James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Ladish Co.
La Pointe Industries Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
Milton Roy Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

Afterburner

Aero Supply Mfg. Co., Inc.
Allen Aircraft Products, Inc.
Arkwin Industries, Inc.
Carleton Aviation Co., Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydromatics, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Mercury Rad Corp.
Ozone Metal Products Corp.
Pierce Governor Co., Inc., The
Pneu-Hydro Valve Corp.
A. U. Stone & Co., Inc.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Air

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
A. K. Allen Co.
Allen Aircraft Products, Inc.
Altair Inc.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Aro Equipment Corp., The
Automatic Switch Co.
Barber-Colman Co.
Barksdale Valves
Bridgeport Brass Co.
Cardox Corp.
A. W. Cash Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
*CORNELIUS CO., THE
Dumont Aircraft Fitting Co.
Dynamic Controls Corp.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Fischer & Porter Co.
Futurecraft Corp.
Galland-Henning Nopak Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Walter J. Hyatt Co., The
Hydromatics, Inc.
Imperial Brass Mfg. Co., The
James, Pond & Clark, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Koehler Aircraft Products Co., Inc.
*KOONTZ-WAGNER ELECTRIC CO., THE
La Pointe Industries Inc.
Lear, Inc.
*WALLACE O. LEONARD, INC.
Lyndon Aircraft, Inc.
M. C. Mfg. Co.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mechanical Air Controls, Inc.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
J. J. Monaghan Co., Inc.
National Airoil Burner Co.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
Rotex Punch Co., Inc.
A. U. Stone & Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Talley Corp., The
Thompson Products, Inc.
Universal Dynamics Corp.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.

Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Anti-Gravity

Aero Supply Mfg. Co., Inc.
Aerotec Corp., The
Arkwin Industries, Inc.
ARO Equipment Corp., The
Clary Dynamics
*CORNELIUS CO., THE
General Controls Co.
Hammel-Dahl, Div.-General Controls
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Walter J. Hyatt Co., The
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Robbins Aviation, Inc.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.

Automatic Shutoff

Altair Inc.
Arkwin Industries, Inc.
Atkomatic Valve Co., Inc.
Automatic Switch Co.
Clary Dynamics
Coppus Engrg. Corp.
Dumont Aircraft Fitting Co.
Essex Mfg. Co., Inc.
Fairbanks Co., The
Fischer & Porter Co.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
*GREER HYDRAULICS, INC.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Robbins Aviation, Inc.
A. U. Stone & Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vickery Co., The
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Autopilot Control

Arkwin Industries, Inc.
Cadillac Gage Co.
*ELECTROL INC.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Hammel-Dahl, Div.-General Controls
Kemp Aero Products, Div.-Kemp Inc.
Lear, Inc.
Ozone Metal Products Corp.
Pneu-Hydro Valve Corp.
*REPUBLIC MFG. CO.
Tactair Valve Div.-Aircraft Products Co.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
Vinson Mfg. Co. Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Bleeder

Aero Supply Mfg. Co., Inc.
A. K. Allen Co.
Arkwin Industries, Inc.
Associated Valve Co.
Auto-Valve Inc.
Clary Dynamics
Dumont Aircraft Fitting Co.
*ELECTROL INC.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
La Pointe Industries Inc.
Gerard G. Leeds Co., Inc.
Mercury Rad Corp.
Oil-Rite Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
*REPUBLIC MFG. CO.
Research Controls
Schutte & Koerting Co.
Sun Electric Corp.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
United Supply Co.
Vickers Inc., Div.-Sperry Rand
*VALCOR ENGRG. CORP.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weatherhead Co., The
Whittaker Controls, Div.-Telecomputing Corp.

By-Pass

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Allen Aircraft Products, Inc.
Arkwin Industries, Inc.
Asociated Valve Co.
Automatic Switch Co.
Barber-Colman Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
Dumont Aircraft Fitting Co.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Ex-Cell-O Corp.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoefner Corp.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
James, Pond & Clark, Inc.
*JANITROL AIRCRAFT DIV-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
La Pointe Industries Inc.
M. C. Mfg. Co.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
Oil-Rite Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Research Controls
Schutte & Koerting Co.
Sun Electric Corp.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vap-Air Div.-Vapor Heating Corp.
Vickers Inc.-Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Check and Check Relief

Aero Supply Mfg. Co., Inc.
Aerotex Corp., The
Airborne Research & Development Corp.
A. K. Allen Co.
Allen Aircraft Products, Inc.
Anderson, Greenwood & Co.
Annin Corp., The
Arkwin Industries, Inc.
Aro Equipment Corp., The
Associated Valve Co.
Auto-Valve Inc.
Barber-Colman Co.
Barksdale Valves
Carleton Aviation Co., Inc.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
*CORNELIUS CO., THE
Dumont Aircraft Fitting Co.
Electric Steel Foundry Co.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Engineered Products Co., The
Essex Mfg. Co., Inc.
Fairbanks Co., The
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Nuclear Corp.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoefner Corp.
Hoke Inc.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Ladish Co.
La Pointe Industries Inc.
*WALLACE O. LEONARD, INC.
Marman Div.-Aeroquip Corp.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div.-Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Research Appliance Co.
Milton Roy Co.
Schutte & Koerting Co.
A. U. Stone & Co., Inc.
Sun Electric Corp.
Sundstrand Turbo Div.-Sundstrand Machine Tool Co.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vap-Air Div.-Vapor Heating Corp.
Vickers Inc. Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co., Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weatherhead Co., The
Whittaker Controls, Div.-Telecomputing Corp.

Check-Hydraulic, Gas

Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Allen Aircraft Products, Inc.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Associated Valve Co.
Carleton Aviation Co., Inc.
Clary Dynamics
*CORNELIUS CO., THE
Dumont Aircraft Fitting Co.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Essex Mfg. Co., The
Futurecraft Corp.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
La Pointe Industries, Inc.
*WALLACE O. LEONARD, INC.
Mar Vista Engrg. Co.
Marman Div.-Aeroquip Corp.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Parker-Hannifin Corp.
Pneu-Hydro Valve Corp.
*REPUBLIC MFG. CO.
Research Appliance Co.
A. U. Stone & Co., Inc.
Sun Electric Corp.
Sunstrand Turbo Div.-Sundstrand Machine Tool Co.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vickery Co., The
Vinson Mfg. Co., Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Control

Aero Supply Mfg. Co., Inc.
Alco Valve Co.
A. K. Allen Co.
Altair Inc.
Arkwin Industries, Inc.
Associated Valve Co.
Atkomatic Valve Co., Inc.
Automatic Switch Co.
Barber-Colman Co.
Barksdale Valves
CDC Control Services, Inc.
A. W. Cash Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
Dumont Aircraft Fitting Co.
Dynamic Controls Corp.
*EASTERN INDUSTRIES, INC.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Fischer & Porter Co.
Futurecraft Corp.
Galland-Henning Nopak Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
General Nuclear Corp.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
Imperial Brass Mfg. Co., The
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
*KOONTZ-WAGNER ELECTRIC CO., INC.
La Pointe Industries Inc.
*WALLACE O. LEONARD, INC.
Lyndon Aircraft, Inc.
M. C. Mfg. Co.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mechanical Air Controls, Inc.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
J. J. Monaghan Co., Inc.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Research Controls
Sun Electric Corp.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products Inc.
Uniflow Valve Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
United Supply Co.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Diaphragm

Aero Supply Mfg. Co., Inc.
Alco Valve Co.
A. K. Allen Co.
Arkwin Industries, Inc.
Automatic Switch Co.
H. Braun Tool & Instrument Co., Inc.
A. W. Cash Co.
Consolidated Controls Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Electric Steel Foundry Co.
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
General Controls Co.
Gray & Huleguard, Inc.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hills-McCanna Co.
Imperial Brass Mfg. Co., The
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
J. J. Monaghan Co., Inc.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Powers Regulator Co., The
Research Controls
Schutte & Koerting Co.
Thompson Products, Inc.
Uniflow Valve Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Dump

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div.-Robertshaw-Fulton Controls Co.
Allan Aircraft Products, Inc.
Arkwin Industries, Inc.
Automatic Switch Co.
Auto-Valve Inc.
Clary Dynamics
Coppus Engrg. Corp.
Engelberg Huller Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Marman Div.-Aeroquip Corp.
Marotta Valve Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Sun Electric Corp.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
Vickery Co., The
Vinson Mfg. Co., Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Whittaker Controls, Div.-Telecomputing Corp.

Electronic Solenoid

Aero Supply Mfg. Co., Inc.
Alco Valve Co.
Altair Inc.
Arkwin Industries, Inc.
Atkomatic Valve Co., Inc.
Automatic Switch Co.
Barksdale Valves
Cadillac Gage Co.
Clary Dynamics
Conax Corp.
Dynamic Controls Corp.
*EASTERN INDUSTRIES, INC.
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
Engelberg Huller Co., Inc.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Nuclear Corp.
Hammel-Dahl, Div.-General Controls
Hays Mfg. Co.
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Areo Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., The
Kohler Co.
*KOONTZ-WAGNER ELECTRIC CO., THE
Gerard G. Leeds Co., The
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div.-Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Skinner Electric Valve Div.-The Skinner Chuck Co.
Sun Electric Corp.
Tactair Valve Div.-Aircraft Products Co.
Telectro Industries Corp.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., HYDRAULICS DIV.

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Engine Inlet

Clary Dynamics
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
La Pointe Industries Inc.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Thompson Products, Inc.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Exhaust

Aeronautical & Instrument Div.—Robertshaw-Fulton Controls Co.
Clary Dynamics
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammel-Dahl, Div.-General Controls
Hydromatics Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
La Pointe Industries Inc.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Ryan Aeronautical Co.
Schutte & Koerting Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
United Supply Co.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Float

Aero Supply Mfg. Co., Inc.
Allen Aircraft Products Inc.
Arkwin Industries, Inc.
Associated Valve Co.
Auto-Valve Inc.
Clary Dynamics
Fairbanks Co., The
Hammel-Dahl, Div.—General Controls
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Pneu-Hydro Valve Corp.
Thompson Products, Inc.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Globe

Anderson, Greenwood & Co.
Annin Corp., The
Arkwin Industries, Inc.
Associated Valve Co.
Carleton Aviation Co., Inc.
Cooper Alloy Corp.
Electric Steel Foundry Co.
General Controls Co.
General Nuclear Corp.
Hammel-Dahl, Div.—General Controls
Hammett Electric Co.
Hoke Inc.
Walter J. Hyatt Co., The
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Ladish Co.
National Airoil Burner Co.
Powers Regulator Co., The
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
Thompson Products, Inc.
Vinson Mfg. Co. Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Helium

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Atkomatic Valve Co., Inc.
Cardox Corp.
Carleton Aviation Co., Inc.
A. W. Cash Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Dumont Aircraft Fitting Co.
Engelberg Huller Co., Inc.
Futurecraft Corp.
General Controls Co.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.—General Controls
Walter J. Hyatt Co., The
Hydromatics, Inc.
James, Pond & Clark, Inc.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
*WALLACE O. LEONARD, INC.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation Inc.
A. U. Stone & Co., Inc.
Talley Corp., The
Thompson Products, Inc.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

High Pressure Gas

Accessory Controls & Equipment Corp.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div.—Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Altair Inc.
Anderson, Greenwood & Co.
Annin Corp., The
Arkwin Industries, Inc.
Aro Equipment Corp., The
Associated Valve Co.
Atkomatic Valve Co., Inc.
Automatic Switch Co.
Barksdale Valves
Cardox Corp.
Clary Dynamics
Conax Corp.
*CORNELIUS CO., THE
Dumont Aircraft Fitting Co.
Dynamic Controls Corp.
Engelberg Huller Co., Inc.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
James, Pond & Clark, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Koehler Aircraft Products Co., Inc.
*KOONTZ-WAGNER ELECTRIC CO., THE
La Pointe Industries Inc.
*WALLACE O. LEONARD, INC.
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Puritan Compressed Gas Corp., Aviation Div.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
A. U. Stone & Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
Uniflow Valve Corp.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Hydraulic System

Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Altair Inc.
American Brake Shoe Co.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Associated Valve Co.
Atkomatic Valve Co., Inc.
Auto-Control Labs., Inc.
Bridgwater Machine Co.
CDC Control Services, Inc.
Cadillac Gage Co.
Carleton Aviation Co., Inc.
Clary Dynamics
*COMMERCIAL SHEARING & STAMPING CO.
Consolidated Controls Corp.
*CORNELIUS CO., THE
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Joe Davidson & Associates
Dumont Aircraft Fitting Co.
Dynamic Controls Corp.
Dynex, Inc.
*EASTERN INDUSTRIES, INC.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
Hydromatics, Inc.
James, Pond & Clark, Inc.
Kearfott Co., Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
*KOONTZ-WAGNER ELECTRIC CO., THE
La Pointe Industries Inc.
Lear, Inc.
*WALLACE O. LEONARD, INC.
Loewy-Hydropress, Div.—Baldwin-Lima-Hamilton
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
H. K. Porter Inc.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Rivett Lathe & Grinder Inc.
Robbins Aviation Inc.
Ryan Aeronautical Co.
A. U. Stone & Co., Inc.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weatherhead Co., The
Weighing & Control Components, Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Hydrogen

Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Atkomatic Valve Co., Inc.
Automatic Switch Co.
Clary Dynamics
Conax Corp.
Cooper Alloy Corp.
Dumont Aircraft Fitting Co.
Futurecraft Corp.
General Controls Co.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Walter J. Hyatt Co., The
Hydromatics, Inc.
James, Pond & Clark, Inc.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
*WALLACE O. LEONARD, INC.
Mar Vista Engrg. Co.
Marotta Valve Corp.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
A. U. Stone & Co., Inc.
Talley Corp., The
Thompson Products, Inc.
Vickery Co., The
Vinson Mfg. Co. Inc.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Motor Operated

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Arkwin Industries, Inc.
Barber-Colman Co.
A. W. Cash Co.
Clary Dynamics
Consolidated Controls Corp.
Cooper Alloy Corp.
Joe Davidson & Associates
Dumont Aircraft Fitting Co.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Nuclear Corp.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hydra-Power Corp.
Hydromatics, Inc.
Imperial Brass Mfg. Co., The
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
La Pointe Industries Inc.
Lyndon Aircraft, Inc.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Motordyne Inc.
Oil-Dyne, Inc.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
Schutte & Koerting Co.
Talley Corp., The
Thompson Products, Inc.
Vap-Air Div., Vapor Heating Corp.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Needle

A. K. Allen Co.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Associated Valve Co.
Auto-Valve Inc.
Cooper Alloy Corp.
Electric Steel Foundry Co.
Engineered Products Co., The
Fairbanks Co., The
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Nuclear Corp.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Hydra-Power Corp.
Ideal-Aerosmith, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
Ladish Co.
Gerard G. Leeds Co., Inc.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
National Airoil Burner Co.
Oil-Dyne, Inc.
Oil-Rite Corp.
Ozone Metal Products Corp.
Pneu-Hydro Valve Corp.
*REPUBLIC MFG. CO.
Research Controls
Robbins Aviation, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
United Supply Co.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Whittaker Controls, Div.-Telecomputing Corp.

Plug

Aero Supply Mfg. Co., Inc.
Allen Aircraft Products, Inc.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
Auto-Valve. Inc.
Carleton Aviation Co., Inc.
Electric Steel Foundry Co.
General Controls Co.
General Nuclear Corp.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
Imperial Brass Mfg. Co., The
James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Ladish Co.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
National Airoil Burner Co.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
*REPUBLIC MFG. CO.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
Vacuum Research Co.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Pneumatic

Accessory Controls & Equipment Corp.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Alco Valve Co.
A. K. Allen Co.
Altair Inc.
Anderson, Greenwood & Co.
Annin Corp., The
Arkwin Industries, Inc.
Aro Equipment Corp., The
Barber-Colman Co.
Barksdale Valves
Cadillac Gage Co.
Cardox Corp.
A. W. Cash Co.
Chandler-Evans, Div.-Pratt & Whitney Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
*CORNELIUS CO., THE
Dynamic Controls Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Engelberg Huller Co., Inc.
Fischer & Porter Co.
Futurecraft Corp.
Galland-Henning Nopak Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
General Nuclear Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hoefner Corp.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
Imperial Brass Mfg. Co., The
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Kohler Co.
Lear, Inc.
*WALLACE O. LEONARD, INC.
Lyndon Aircraft, Inc.
M. C. Mfg. Co.
Mar Vista Engrg. Co.
Marman Div., Aeroquip Corp.
Marotta Valve Corp.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Powers Regulator Co., The
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
Research Controls
Rivett Lathe & Grinder Inc.
Robbins Aviation, Inc.
Ryan Aeronautical Co.
A. U. Stone & Co., Inc.
Tactair Valve Div.-Aircraft Products Co.
Talley Corp., The
Thompson Products, Inc.
Uniflow Valve Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
United Control Corp.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Power Control

Aero Supply Mfg. Co., Inc.
Annin Corp., The
Arkwin Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
CDC Control Services, Inc.
Carleton Aviation Co., Inc.
Clary Dynamics
Consolidated Controls Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Nuclear Corp.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hammett Electric Co.
Hoefner Corp.
Hydra-Power Corp.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
*KOONTZ-WAGNER ELECTRIC CO., THE
*WALLACE O. LEONARD, INC.
Marotta Valve Corp.
Marquardt Aircraft Co.
Mercury Rad Corp.
Ozone Metal Products Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
*RHEEM MFG. CO., AIRCRAFT DIV.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vickery Co., The
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Pressure Regulating

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Aerotec Corp., The
Airborne Research & Development Corp.
Alco Valve Co.
Altair Inc.
American Power Jet Co.
Annin Corp., The
Arkwin Industries, Inc.
ARO Equipment Corp., The
Associated Valve Co.
Barksdale Valves
CDC Control Services, Inc.
A. W. Cash Co.
Clary Dynamics
Consolidated Controls Corp.
*CORNELIUS CO., THE
Devilbiss Co., The
*EASTERN INDUSTRIES, INC.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Hoke Inc.
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
*KAHN & CO., INC.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Koehler Aircraft Products Co., Inc.
Kohler Co.
*WALLACE O. LEONARD, INC.
Loewy-Hydropress, Div.—Baldwin-Lima-Hamilton
M. C. Mfg. Co.
Marman Div., Aeroquip Corp.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Powers Regulator Co., The
Progressive Research & Development Co., Inc.
Puritan Compressed Gas Corp., Aviation Div.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Sun Electric Corp.
Thompson Products, Inc.
Uniflow Valve Corp.
*UNITED AIRCRAFT PRODUCTS, INC.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

Relief and By-Pass

Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airborne Research & Development Corp.
Allen Aircraft Products, Inc.
American Power Jet Co.
Anderson, Greenwood & Co.
Arkwin Industries, Inc.
ARO Equipment Corp., The
Associated Valve Co.
Auto-Valve Inc.
CDC Control Services, Inc.
A. W. Cash Co.
Clary Dynamics

*CORNELIUS CO., THE
Dumont Aircraft Fitting Co.
*EASTERN INDUSTRIES, INC.
*ELECTROL INC.
Engelberg Huller Co., Inc.
Engineered Products Co., The
Ex-Cell-O Corp.
Futurecraft Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
B. H. Hadley, Inc.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydraulic Press Mfg. Co., The, Div.-Koehring Co.
James, Pond & Clark, Inc.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Lear, Inc.
*WALLACE O. LEONARD, INC.
M. C. Mfg. Co.
Marotta Valve Corp.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
J. J. Monaghan Co., Inc.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pioneer-Central Div., Bendix Aviation Corp.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
Reaction Motors, Inc.
*REPUBLIC MFG. CO.
Milton Roy Co.
A. U. Stone & Co., Inc.
Sun Electric Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Restrictor

Arkwin Industries, Inc.
Aro Equipment Corp., The
Associated Valve Co.
Auto-Valve Inc.
CDC Control Services, Inc.
Clary Dynamics
*CORNELIUS CO., THE
Cuno Engrg. Corp., The
Dumont Aircraft Fitting Co.
*GREER HYDRAULICS, INC.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kemp Aero Products, Div.-Kemp Inc.
Kohler Co.
Marotta Valve Corp.
Mercury Rad Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
*REPUBLIC MFG. CO.
A. U. Stone & Co., Inc.
Sun Electric Corp.
Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
*UNITED AIRCRAFT PRODUCTS, INC.
*VALCOR ENGRG. CORP.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
*WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.
Whittaker Controls, Div.-Telecomputing Corp.

Rocket Fuel

Aero Supply Mfg. Co., Inc.
Airborne Research & Development Corp.
Annin Corp., The
Arkwin Industries, Inc.
Associated Valve Co.
Atkomatic Valve Co., Inc.
Automatic Switch Co.
CDC Control Services, Inc.
A. W. Cash Co.
Clary Dynamics
Conax Corp.
Dumont Aircraft Fitting Co.
Dean & Benson Research Inc.
Fischer & Porter Co.
Futurecraft Corp.
General Controls Co.
B. H. Hadley, Inc.
Hainer Valves, Inc.
Hammel-Dahl, Div.-General Controls
Hoefner Corp.
Walter J. Hyatt Co., The
Hydromatics, Inc.
Herrick L. Johnston, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Koehler Aircraft Products Co., Inc.
Kohler Co.
Lear, Inc.
Marotta Valve Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Parker Aircraft Co.
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Pioneer-Central Div., Bendix Aviation Corp.
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Wright Aeronautical Div., Curtiss-Wright Corp.

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Bendix Products Div., Bendix Aviation Corp.
Clary Dynamics
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General Nuclear Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammel-Dahl, Div.-General Controls
Walter J. Hyatt Co., The
Hydra-Power Corp.
Hydromatics, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Mercury Rad Corp.
Parker Aircraft Co.
Pierce Governor Co., Inc., The
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
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Vickers Inc., Div.-Sperry Rand
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Vickery Co., The
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Sequence

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Futurecraft Corp.
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Hydra-Power Corp.
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Marotta Valve Corp.
Mechanical Air Controls, Inc.
Mercury Rad Corp.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
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Penu-Hydro Valve Corp.
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Tactair Valve Div.-Aircraft Products Co.
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Servo

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Arkwin Industries, Inc.
Bendix Products Div., Bendix Aviation Corp.
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Cadillac Gage Co.
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*EASTERN INDUSTRIES, INC.
*ELECTROL INC.
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Hagan Chemicals & Controls, Inc.
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Ideal-Aerosmith, Inc.
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Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
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Mar Vista Engrg. Co.
Mercury Rad Corp.
Oil-Dyne, Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pesco Products Div.—Borg-Warner Corp.
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Royal Industries, Inc.
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James, Pond & Clark, Inc.
Kemp Aero Products, Div.-Kemp Inc.
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Pacific Div.-Bendix Aviation Corp.
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Atkomatic Valve Co., Inc.
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Coppus Engrg. Corp.
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Electro-Tech Equipment Co.
Engelberg Huller Co., Inc.
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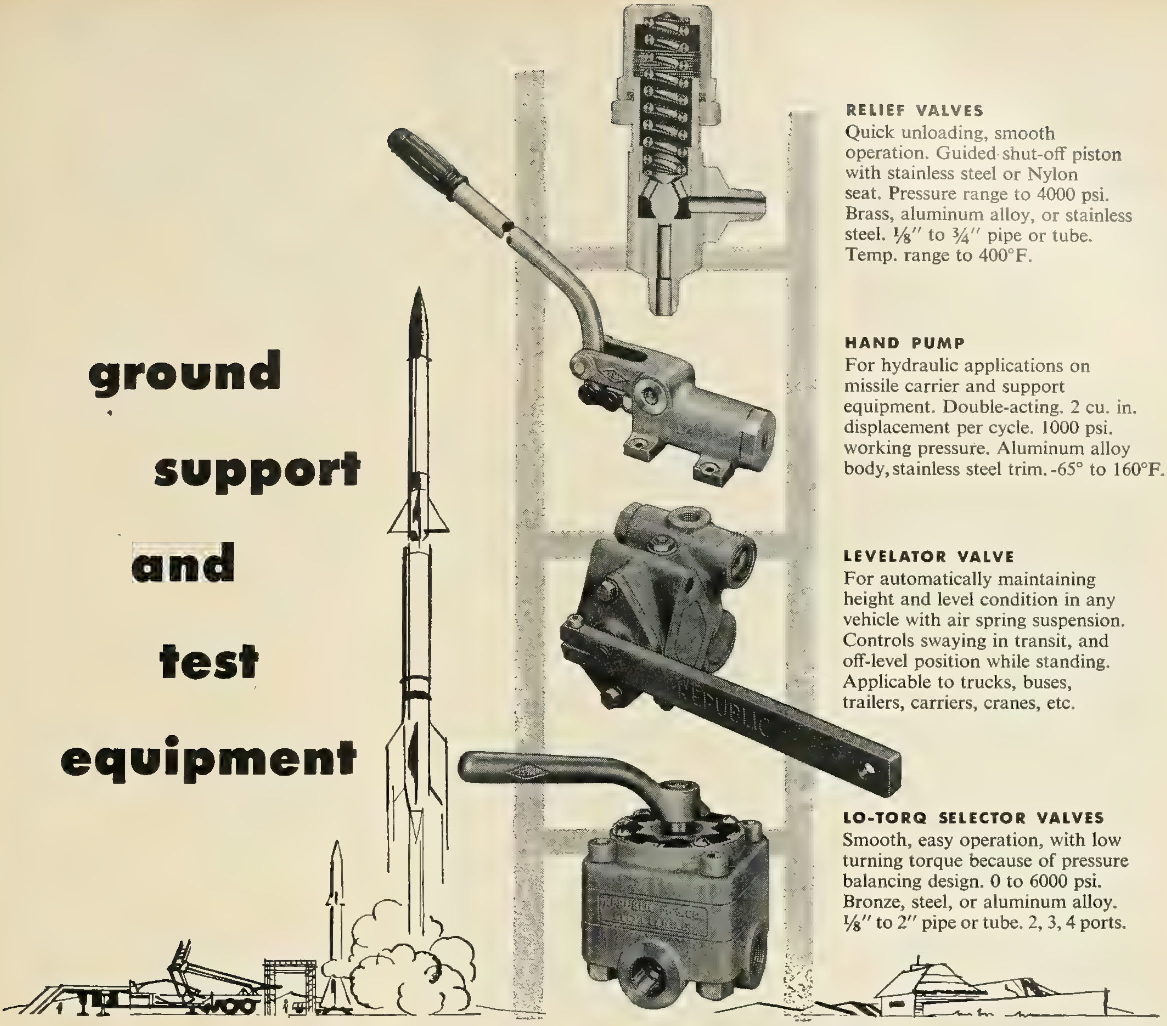

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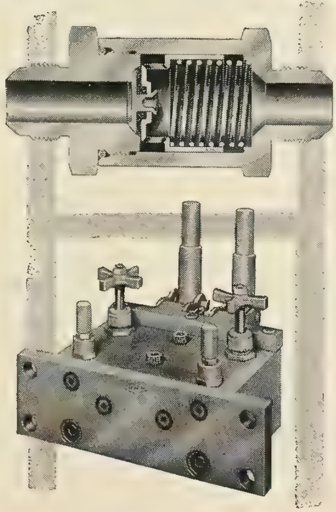

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Hammel-Dahl, Div.-General Controls
Hydromatics, Inc.
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Koehler Aircraft Products Co., Inc.
Ladish Co.
A. Y. McDonald Mfg. Co.
Mercury Rad Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Progressive Research & Development Co., Inc.
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Veeco Vacuum Corp.
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Ozone Metal Products Corp.
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Pneu-Hydro Valve Corp.
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Hammel-Dahl, Div.-General Controls
Kemp Aero Products, Div.-Kemp Inc.
Pneu-Hydro Valve Corp.
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***UNITED AIRCRAFT PRODUCTS, INC.**
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J-V-M Microwave Co.
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General Cable Corp.
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Okonite Co., The
Plastoid Corp.
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Times Wire & Cable Co., Inc.
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Warren Wire Co.
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Secon Metals Corp.
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J. M. Ney Co., The
Secon Metals Corp.
Standard Metals Corp.

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Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Bliss Electronic Corp.
William Brand & Co., Inc.
Consolidated Wire & Associated Companies
Elco Corp.
Electric Auto-Lite Co., The
Electric Parts Corp.
First Electronics Corp., The
Hallett Mfg. Co.
Illumitronic Engrg. Co.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
Manger Electric Co.
Modelectric Products Corp.
Packard Electric Div.-General Motors Corp.
Rowe Industries
Schaffer Air Industries, Inc.
Servicair Co.
Sheltered Workshop
Sittler Corp.
Skytronics
Surprenant Mfg. Co.
Tri-Dex Co.
Tucson Instrument Corp.
Warren Wire Co.
Westbury Electronics Inc.
Western International Co.
Winder Aircraft Corp. of Fla.
Zippertubing Co., The

High Voltage

Accurate Insulated Wire Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
General Cable Corp.
Hallett Mfg. Co.
Jefferson Products Corp.
Mohawk Wire & Cable Corp.
***NORMANDY ELECTRIC WIRE CORP.**
Okonite Co., The
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
John A. Roebling Sons Corp.
Rome Cable Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Times Wire & Cable Co., Inc.
Topper Mfg. Co., Inc.
Warren Wire Co.
Western International Co.

Hook-Up

Accurate Insulated Wire Corp.
Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
***AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.**
American Super Temperature Wires Inc.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Copperweld Steel Co., Wire & Cable Div.
Electric Auto-Lite Co., The, Wire & Cable Div.
Electric Parts Corp.
Essex Wire Corp.
General Cable Corp.
***HUDSON WIRE CO.**
Jefferson Products Corp.
Mohawk Wire & Cable Corp.
New England Electrical Works, Inc.
***NORMANDY ELECTRIC WIRE CORP.**
Okonite Co., The
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Rex Corp., The
Rome Cable Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Topper Mfg. Co., Inc.
Victor Electric Wire & Cable Corp.
Western International Co.

Litz

American Super Temperature Wires Inc.
Beledn Mfg. Co.
Birnbach Radio Co., Inc.
Consolidated Wire & Associated Companies
General Cable Corp.
***HUDSON WIRE CO.**
New England Electrical Works, Inc.
Topper Mfg. Co., Inc.
Western International Co.

Magnet

Alpha Wire Corp.
American Super Temperature Wires Inc.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
Chase Brass & Copper Co., Inc.
Consolidated Wire & Associated Companies
Crucible Steel Co. of America
Electric Auto-Lite Co., The, Wire & Cable Div.
Elmet Div.-North American Philips Co., Inc.
Essex Wire Corp.
General Cable Corp.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
New England Electrical Works, Inc.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Topper Mfg. Co., Inc.
Warren Wire Co.

Resistance and Filament

American Electric Cable Co.
Belden Mfg. Co.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Electric Parts Corp.
Magnetic Shield Div.-Perfection Mica Co.
Micro-Wire Tungsten & Molybdenum Products
J. M. Ney Co., The
Secon Metals Corp.

Shielded

Accurate Insulated Wire Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Co-Operative Industries, Inc.
Electric Auto-Lite Co., The
Essex Wire Corp.
General Cable Corp.
Hallett Mfg. Co.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
Jefferson Products Corp.
Mohawk Wire & Cable Corp.
Okonite Co., The
***NORMANDY ELECTRIC WIRE CORP.**
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Precision Tube Co., Inc.
Rex Corp., The
John A. Roeblings Sons Corp.
Rome Cable Corp.
Royal Electric Corp.
Sequoia Wire Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Topper Mfg. Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western International Co.

Teflon Insulated

Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Super Temperature Wires Inc.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Delta Chemical Works, Inc.
Electric Auto-Lite Co., The, Wire & Cable Div.
General Cable Corp.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
Lewis Engrg. Co., The
Okonite Co., The
***NORMANDY ELECTRIC WIRE CORP.**
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
***HAROLD H. POWELL CO.**
Rex Corp., The
Royal Electric Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Topper Mfg. Co., Inc.
Warren Wire Co.
Western International Co.

WRENCHES

Aircraft Mechanics, Inc.
Calcor Corp., Aircraft Div.
***BILLINGS & SPENCER CO., THE**
Black & Decker Mfg. Co., The
Gardner-Denver Co.
Kelsey-Hayes Co.
Owatonna Tool Co.
Richmont, Inc.
Stevens Walden Inc.
Utica Drop Forge & Tool Div.-Kelsey Hayes Co.
J. H. Williams Co.

X-RAY EQUIPMENT, INDUSTRIAL

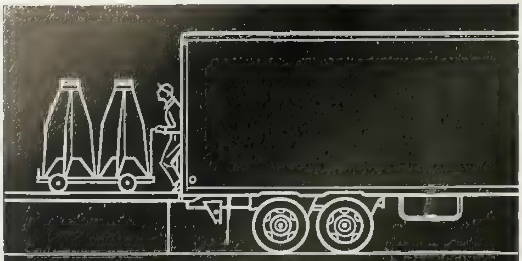
Bar-Ray Products, Inc.
Eastman Kodak Co.
Geisler Labs.
Hammett Electric Co.
D. W. Onan & Sons Inc.
Wave Particle Corp.
***WESTINGHOUSE ELECTRIC CORP.**

YOKES, DEFLECTION

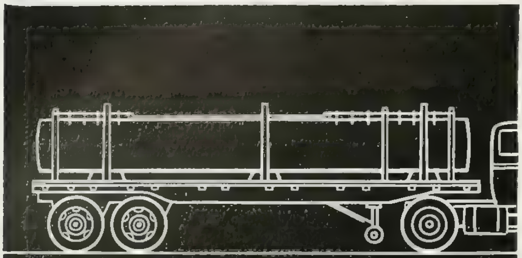
Amatom Electronic Hardware Co. Inc.
American Car & Foundry Div., ACF Industries, Inc.
American Research & Mfg. Corp.
Celco-Constantine Engrg. Laboratories Co.
Corbin Products Div.
Dynametrics Corp.

GROUND HANDLING EQUIPMENT

Ground handling equipment is used to transport and place missiles in firing position; *i.e.*, trucks, cranes and dollies.



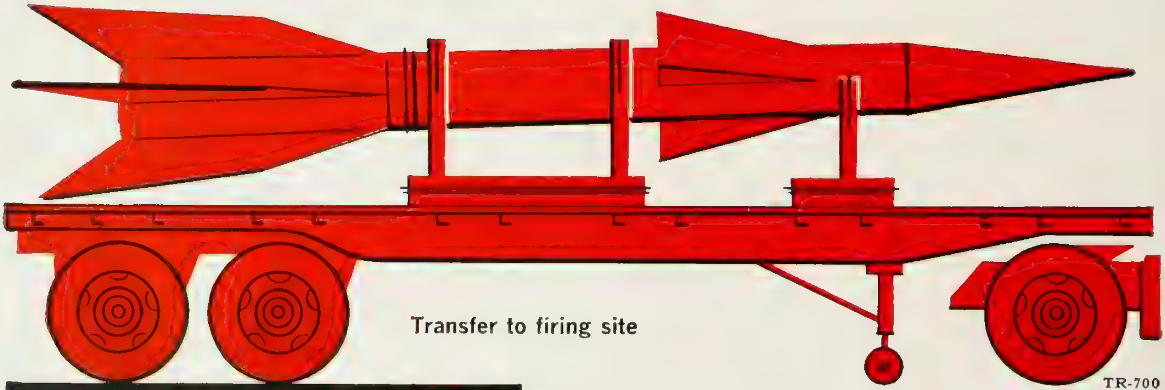
Component shipment



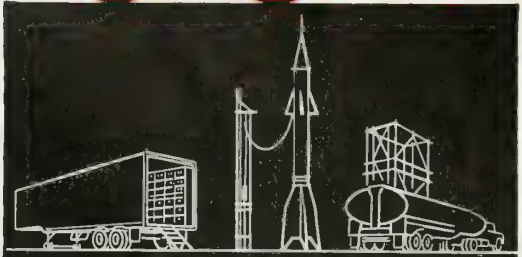
Shipment to storage

From Conception to Count-Down . . .

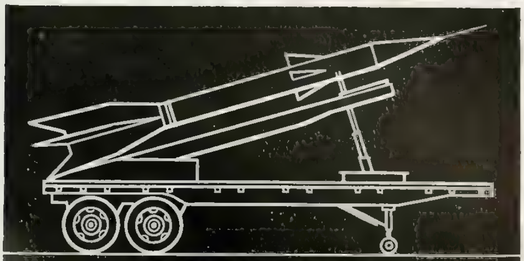
TRAILMOBILE TRAILERS MOVE MISSILES



Transfer to firing site



Fueling and checkout



Mobile firing platform

Find out how Trailmobile trailer experience can help you with missile handling problems. Call or write to Mr. John Zepf, Manager, Contract Department, Trailmobile Inc., Cincinnati 9, Ohio.

TRAILMOBILE INC.
Cincinnati 9, Ohio

GROUND HANDLING EQUIPMENT

ACCESSORIES & SUPPLIES, LIGHTING

Alden Systems Co.
*COOPER DEVELOPMENT CORP.
Day-Ray Products, Inc.
Georator Corp.
Merix Chemical Co.
Skiatron Electronics & Television Corp.
Star Engraving Co., Ltd.
*WESTINGHOUSE ELECTRIC CORP.
Winder Aircraft Corp. of Fla.

ACCUMULATORS, HYDRAULIC

American Car & Foundry Div., ACF Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Applied Dynamics Corp.
Arkwin Industries, Inc.
Autonetics, Div.-North American Aviation, Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
*COOPER DEVELOPMENT CORP.
*GREER HYDRAULICS, INC.
Hydra-Power Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kelsey-Hayes Co.
Kemp Aero Products, Div.-Kemp Inc.
Menasco Mfg. Co.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Parker-Hannifin Corp.
Philips & Davies Inc.
Portland Copper & Tank Works Inc.
Ryan Aeronautical Co.
Thompson Products, Inc.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Washington Technological Associates Inc.
Wells Industries Corp.
Wickfield, Inc.

ADAPTERS, BATTERY

*AMERICAN MACHINE & FOUNDRY CO.
Winder Aircraft Corp. of Fla.

ADAPTERS, LAMP SOCKET

American Brass Co., The
Kulka Electric Corp.
Frank W. Morse Co.
Winder Aircraft Corp. of Fla.

ALUMINUM

All Boro Metal Products Co., Inc.
Aluminum Co. of America
American Brake Shoe Co.
Empire State Aluminum Corp.
Harvey Aluminum
Kaiser Aluminum & Chemical Sales, Inc.
Lane Electronics Mfg. Corp.
Light Metals, Inc.
Modglin Co. Inc.
Pioneer Aluminum Inc.
Revere Copper & Brass Inc.
Rodney Metals Inc.
*WASHINGTON ALUMINUM CO., INC.

AMPLIFIERS, INDUSTRIAL SOUND

American Electronics, Inc.
Brush Instruments, Div.-Clevite Corp.
Highland Engrg. Co.
*INTERELECTRONICS CORP.
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Gerard G. Leeds Co., Inc.
Magnasync Mfg. Co., Ltd.
Owen Labs., Inc.
Seeburg Corp., The
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Terminal Radio Corp.
Western Electro-Acoustic Lab.

AMPLIFIERS, MICROPHONE

Brush Instruments, Div.-Clevite Corp.
General Instrument Corp., Defense Products Div.
*INTERELECTRONICS CORP.
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Magnasync Mfg. Co., Ltd.
J. A. Maurer, Inc.
Seeburg Corp., The
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Western Electro-Acoustic Lab.

AMPLIFIERS, MIXING AUDIO

American Electronics, Inc.
Electromation Co.
Hallamore Electronics Co.
*INTERELECTRONICS CORP.
Kinevox-Hallen
La Pointe Industries Inc.
Magnasync Mfg. Co., Ltd.
J. A. Maurer, Inc.
Seeburg Corp., The
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Westbury Electronics Inc.
Western Electro-Acoutic Lab.

ANALYZERS, CABLE

California Technical Industries, Div.-Textron Inc.
Dit-Mco, Inc., Electronics Div.
International Electric Industries, Inc.
Kay Electric Co.
Leeds & Northrup Co.
Simpson Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.
Transvision, Inc.

ANTENNAS, MOBILE COMMUNICATION

American Brass Co., The
*AMERICAN MACHINE & FOUNDRY CO.
American Printed Circuits Co., Inc.
Andrew Corp.
Communications Co.
*COOPER DEVELOPMENT CORP.
Defiance Engrg. & Microwave Corp.
Electric Auto-Lite Co., The, Wire & Cable Div.
Freeman Co., The
Gabriel Co., The Gabriel Electronics Div.
General Railway Signal Co.
Illumitronic Engrg. Co.
Kelsey-Hayes Co.
D. S. Kennedy & Co.
La Pointe Industries Inc.
Motorola Inc., Military Marketing Div.
Narda Microwave Corp., The
Permax Products Div., Chisholm-Ryder Co., Inc.
Prodelin Inc.
Reeves Instrument Corp.
Scala Radio Co.
Shaw Metal Products Corp.
Technical Appliance Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Winder Aircraft Corp. of Fla.

ASSEMBLIES, CABLE

ACF Industries, Inc., Advanced Products Div.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alpha Wire Corp.
American Super-Temperature Wires, Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Co., Inc.
Belden Mfg. Co.
Bergen Wire Rope Co.
Birnbach Radio Co., Inc.
Bliss Electronic Corp.
William Brand & Co., Inc.
California Technical Industries, Div.-Textron Inc.
Centronix Inc.
Coaxial Connector Co. Inc.
*COOPER DEVELOPMENT CORP.
Dale Products, Inc.
Dittmore-Freimuth Corp.
Dwyer Engrg. Co., Inc.
Empire Electronics Co., Inc.
Food Machinery & Chemical Corp., Ordnance Div.
Hallamore Electronics Co.
Hallett Mfg. Co.
Hi-Lo Manufacturing Corp.
Hoover Electronics Co.
International Electric Industries, Inc.
Walter K. Jaros, Aircrafters
*KAHN & CO., INC.
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Missile Engrg. Products, Inc.
J. J. Monaghan Co., Inc.
Resdel Engrg. Corp.
John A. Roeblings Sons Corp.
Rowe Industries
Schaffer Air Industries, Inc.
Shaw Metal Products Corp.
Sheltered Workshop
Surprenant Mfg. Co.
Technical Appliance Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Times Wire & Cable Co., Inc.
Transco Products, Inc.
Transvision, Inc.
Tricraft Products Corp.
Tri-Dex Co.
Tucson Instrument Corp.
Twix Mfg. Co., Inc.
Victor Electric Wire & Cable Corp.
Wells Industries Corp.
Westbury Electronics Inc.
Western International Co.
Wickfield, Inc.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

ASSEMBLY EQUIPMENT, AUTOMATIC

Alden Systems Co.
*AMERICAN MACHINE & FOUNDRY CO.
Barnes Development Co.
Champion Airquipment Inc.
Consolidated Avionics Corp.
Food Machinery & Chemical Corp., Ordnance Div.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Machine Engrg. Co. Inc.
Philco Corp., Government & Industrial Divs.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.
Telectro Industries Corp.
Thompson Products, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Washington Technological Associates Inc.
Winder Aircraft Corp. of Fla.

AUTOMATIC ASSEMBLY EQUIPMENT

*AMERICAN MACHINE & FOUNDRY CO.
Barnes Development Co.
Consolidated Avionics Corp.
Eriez Mfg. Co.
Food Machinery & Chemical Corp., Ordnance Div.
G. W. Galloway Co.
Hallamore Electronics Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Mast Development Co., Inc.
*PACKARD-BELL ELECTRONICS CORP.
Philco Corp., Government & Industrial Divs.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.
Telectro Industries Corp.
Twix Mfg. Co., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Washington Technological Associates Inc.
Winder Aircraft Corp. of Fla.

AUXILIARY POWER SOURCES

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., Red Bank Div.
Consolidated Avionics Corp.
Joe Davidson & Associates
Eagle-Picher Co., The
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gremco, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Walter Kidde & Co., Inc., Aviation Div.
Leach Corp.
McCormick Selph Associates
*MOTOR GENERATOR CORP.
D. W. Onan & Sons Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Propellex Chemical Corp.
Reaction Motors, Inc.
Solar Aircraft Co.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.

PHOTO ON GROUND HANDLING EQUIPMENT DIVIDER PAGE: After erecting missile to vertical position, the vehicle, built by R. G. Letourneau, Inc., eases missile onto launcher for firing.

. . . ground handling

Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Telectro Industries Corp.
Thompson Products, Inc.
Turbo Dynamics Corp.
Ultradyne, Inc.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
*WESTINGHOUSE ELECTRIC CORP.
Wickfield, Inc.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

BALL BEARINGS

Ahlberg Bearing Co.
Corning Glass Works
Hammett Electric Co.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Raway Bearing Co.
United Supply Co.

BALL JOINTS

Allegan Instrument Co., Inc.
Arrowhead Products, Div.—Federal-Mogul-Bower Bearings, Inc.
Bridgwater Machine Co.
Century Fasteners Corp.
Corbin Products Div.
Walter K. Jaros, Aircrafters
Parker Aircraft Co.
Penn-Michigan Mfg. Corp.
Ryan Aeronautical Co.
Southwest Products Co.
Thompson Products, Inc.
United Supply Co.
Vickery Co., The

BASES

Bridgwater Machine Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
G. M. Dykes Iron Works, Inc.
G. W. Galloway Co.
Willard Storage Battery Div.

BATTERIES

*AMERICAN MACHINE & FOUNDRY CO.
Bowers Battery & Spark Plug Co.
Burgess Battery Co.
Carbone Corp., The
Frank R. Cook Co.
G. M. Dykes Iron Works, Inc.
Eagle-Picher Co., The
Electric Auto-Lite Co., The
*EXIDE INDUSTRIAL DIV.—THE ELECTRIC STORAGE BATTERY CO.
*INTERELECTRONICS CORP.
P. R. Mallory & Co. Inc.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Telectro Industries Corp.
Terminal Radio Corp.
Yardney Electric Corp.

BATTERY BOXES, CRADLES, ETC.

Aerolite Electronics Corp.
Associated Co., Inc.
*FRUEHAUF TRAILER CO.
General Scientific Equipment Co.
Ludwig Honold Mfg. Co.
Muckle Mfg. Co.
Resdel Corp.
Shaw Metal Products Corp.
Swedlow Plastics Co.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

BATTERY CHARGING AND SERVICING EQUIPMENT

Acme Electric Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Amelco, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Television & Radio Co.
Automatic Switch Co.
Bogue Electric Mfg. Co.
Christie Electric Corp.
Joe Davidson & Associates
Dayton Mfg. Co., Inc.
Electronic Measurements Corp.
*EXIDE INDUSTRIAL DIV.—THE ELECTRIC STORAGE BATTERY CO.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
General Railway Signal Co.
Georator Corp.
Green Rectifier Co.
Gremco, Inc.
Hammett Electric Co.
Hertner Electric Co., The
Leach Corp.
Lee Electric & Mfg. Co.
Lincoln Electric Co., The
P. R. Mallory & Co. Inc.
D. W. Onan & Sons Inc.
Opad Electric Co.
*RHEEM MFG. CO., ELECTRONICS DIV.
Schauer Mfg. Corp.
Sun Electric Corp.
Telectro Industries Corp.
United States Dynamics Corp.
Wickes Engrg. & Construction Co. Inc.
Willard Storage Battery Div.
Winder Aircraft Corp. of Fla.
Yardney Electric Corp.

BEARINGS

Ampco Metal, Inc.
Cleveland Graphite Bronze Co., Div.—Clevite Corp.
Collins Engrg. Corp.
Dodge Mfg. Corp.
Dumont Aircraft Fitting Co.
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Kaydon Engrg. Corp., The
Marlin-Rockwell Corp.
Miniature Precision Bearings, Inc.
Monarch Aircraft Sales, Inc.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Raway Bearing Co.
Torrington Co., The
United Supply Co.

Ball

Dodge Mfg. Corp.
Dumont Aircraft Fitting Co.
Hammett Electric Co.
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Marlin-Rockwell Corp.
Miniature Precision Bearings, Inc.
Monarch Aircraft Sales, Inc.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
Raway Bearing Co.
United Supply Co.

Needle

Collins Engrg. Corp.
Dumont Aircraft Fitting Co.
Industrial Tectonics, Inc.
Kaydon Engrg. Corp., The
Monarch Aircraft Sales, Inc.
Orange Roller Bearing Co., Inc.
Raway Bearing Co.
Roller Bearing Co. of America
Torrington Co., The
United Supply Co.

Rod End

Chain Belt Co.
Cleveland Graphite Bronze Co., Div.—Clevite Corp.
Collins Engrg. Corp.
Freeman Co., The
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Marlin-Rockwell Corp.
Monarch Aircraft Sales, Inc.
Raway Bearing Co.
Southwest Products Co.
United Supply Co.

Roller

Chain Belt Co.
Collins Engrg. Corp.
Dodge Mfg. Corp.
Industrial Tectonics, Inc.
Kaydon Engrg. Corp., The
Marlin-Rockwell Corp.
Monarch Aircraft Sales, Inc.
Orange Roller Bearing Co., Inc.
Raway Bearing Co.
Roller Bearing Co. of America
Torrington Co., The
United Supply Co.

Roller Taper

Collins Engrg. Corp.
Dodge Mfg. Corp.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Monarch Aircraft Sales, Inc.
Timken Roller Bearing Co., The
Torrington Co., The
United Supply Co.

Self Aligning

Amplex Div.—Chrysler Corp.
Bound Brook Oil-less Bearing Co.
Chain Belt Co.
Cleveland Graphite Bronze Co., Div.—Clevite Corp.
Dodge Mfg. Corp.
*GRAPHITE METALLIZING CORP.
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Keystone Carbon Co.
Monarch Aircraft Sales, Inc.
Randall Graphite Bearings, Inc.
Raway Bearing Co.
Southwest Products Co.
Torrington Co., The

BOLTS, SPADE

Abbott Screw & Mfg. Co.
Affiliated Screw Products Co.
Allmetal Screw Products Co., Inc.
Amatom Electonic Hardware Co. Inc.
Briles Mfg.
Century Fasteners Corp.
Corbin Products Div.
Dumont Aviation Associates
Federal Screw Products Inc.
Walter K. Jaros, Aircrafters

BOXES, STORAGE

American Car & Foundry Div., ACF Industries, Inc.
Applied Design Co.
Basic Tool Industries Inc.
Bekins Industrial Packaging
Champion Airquipment Inc.
*CRAIG SYSTEMS, INC.
*ECKOL PACKAGING CO.
Econoweld Corp.
*FRUEHAUF TRAILER CO.
Muckle Mfg. Co.
National Metal Edge Box Co.
Seamless Products Co., Inc.
Shaw Metal Products Corp.
Skydyne Inc.
Stevens Walden Inc.
Swedlow Plastics Co.
TA Mfg. Corp.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co
*WASHINGTON ALUMINUM CO., INC.

BRACKETS, HARDWARE

Aerolite Electronics Corp.
American Brass Co., The
Basic Tool Industries, Inc.
Bridgwater Machine Co.
G. M. Dykes Iron Works, Inc.
Keystone Electronics Corp.
La Pointe Industries Inc.
R. C. Mahon Co., The
*RYAN INDUSTRIES
TA Mfg. Corp.
Thompson Products, Inc.
*WASHINGTON ALUMINUM CO., INC.

BRAKE CONTROL UNITS

Bridgwater Machine Co.
Cutler-Hammer Inc.
B. F. Goodrich Aviation Products
Green Rectifier Co.
Hydra-Power Corp.
Kemp Aero Products, Div.-Kemp Inc.
Minnesota Automotive, Inc.
Robot Appliances Inc.

BRAKE DRUMS

Bridgwater Machine Co.
Clark Equipment Co.
Cutler-Hammer Inc.
B. F. Goodrich Aviation Products
Kelsey-Hayes Co.
La Pointe Industries Inc.

BRAKE LININGS

American Brake Shoe Co.
Clark Equipment Co.
B. F. Goodrich Aviation Products
Raybestos-Manhattan, Inc.
S. K. Wellman Co., The

BRAKES, ELECTRICAL

American Flexible Coupling Div., Zurn Industries, Inc.
Cutler-Hammer Inc.
Exact Engrg. & Mfg. Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Kelsey-Hayes Co.
Lyndon Aircraft, Inc.
Robot Appliances Inc.

BRAKES, MAGNETIC

American Flexible Coupling Div., Zurn Industries, Inc.
Cutler-Hammer Inc.
Dial Products Co.
Eaton Mfg. Co.
Exact Engrg. & Mfg. Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Kelsey-Hayes Co.
Lyndon Aircraft, Inc.
Reid Metal Products, Inc.

T	E	L	E	M	E	T	E	R	I	N	G
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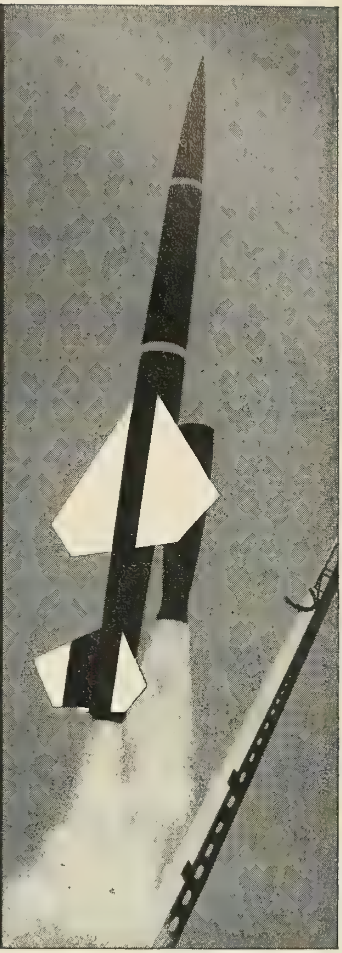

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Organic Development Corp., Spectra—Strip Div.
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International Electric Industries, Inc.
Lewis Engrg. Co., The
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Rockbestos Products Corp.
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William Brand & Co., Inc.
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William Brand & Co., Inc.
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Hitemp Wires, Inc.
Mohawk Wire & Cable Corp.
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Prodelin Inc.
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Rockbestos Products Corp.
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Royal Electric Corp.
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Rome Cable Corp.
Royal Electric Corp.
Sequoia Wire Co.
Technical Appliance Corp.
Times Wire & Cable Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western International Co.
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Aluminum Co. of America
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Boston Insulated Wire & Cable Co.
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Hallamore Electronics Co.
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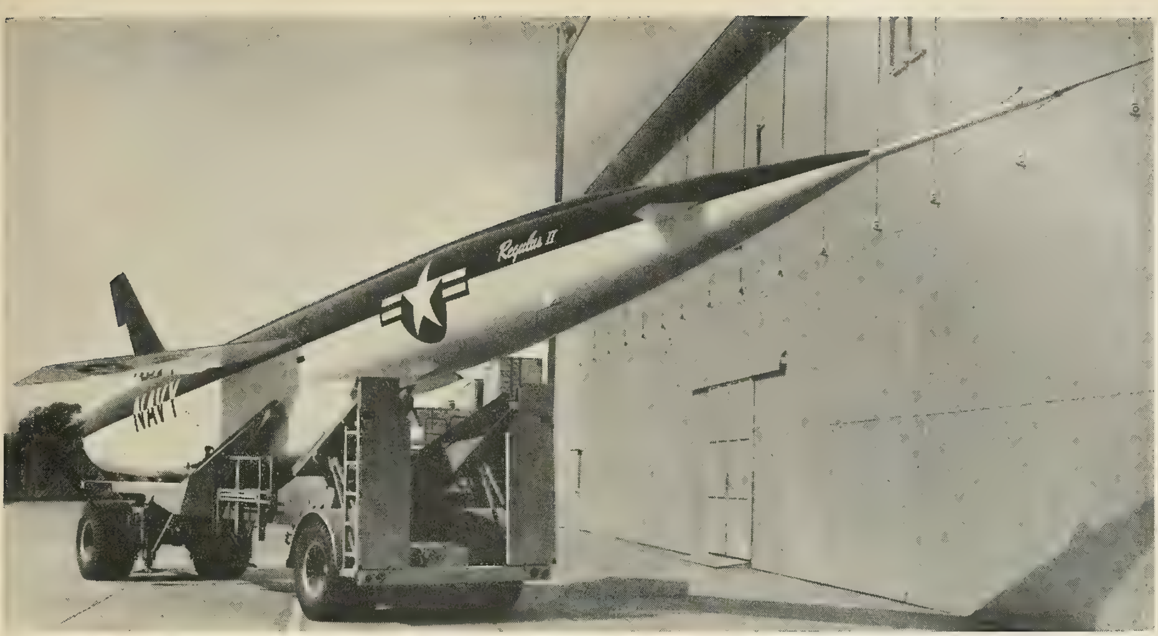

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Kickhaefer Mfg. Co.
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American Brass Co., The
Atlas E-E Corp.
Birnbach Radio Co., Inc.
Corbin Products Div.
Dakota Engrg., Inc.
Walter J. Hyatt Co., The
Walter K. Jaros, Aircrafters
Keystone Electronics Corp.
Kickhaefer Mfg. Co.
Kulka Electric Corp.
Progressive Research & Development Co., Inc.
TA Mfg. Corp.

CLOTH, RUBBERIZED

Connecticut Hard Rubber Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
C. R. Daniels, Inc.
B. F. Goodrich Industrial Products Co.
Green, Tweed & Co.
Rubbercraft Corp. of California
M. L. Snyder & Son, Inc.

COIL WINDING MACHINES, TOROIDAL

Alden Products Co.
Associated American Winding Co., Inc.
Coil Winding Equipment Co.
Magnavox Co., The

COILS, HEATING

Acme Electric Heating Co.
Advanced Electronics, Inc.
Associated American Winding Co., Inc.
Hammett Electric Co.
Micro-Wire Tungsten & Molybdenum Products
J. J. Monaghan Co., Inc.
Precision, Inc
***RYAN INDUSTRIES**
Telectro Industries Corp.
Trane Co., The
Vulcan Electric Co., Div.-Consolidated Electric Lamp Co. Inc.

COILS, SPEAKER

Aerolite Electronics Corp.
Associated American Winding Co., Inc.
Magnavox Co., The
J. J. Monaghan Co., Inc.
Waldom Electronics Inc.
Wright Zimmerman, Inc.

COMPOUNDS, CLEANING

Acoustica Associates, Inc.
Avondale Co., The
George Basch Co., The
Delta Chemical Works, Inc.
Glisten Co., The
Penetone Co., The
L. Sonneborn & Sons, Inc., Building Products Div.
Trio Chemical Works, Inc.
Turco Products, Inc.
Wye Industries

COMPRESSOR ASSEMBLIES, MOBILE

Accessory Controls & Equipment Corp.
Air Logistics Corp.
Air Products, Inc.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
American Brake Shoe Co.
Cardox Corp.
Champion Pneumatic Machinery Co.
***CORNELIUS CO., THE**
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
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Haskell Engrg. & Supply Co.
Joy Mfg. Co.
Walter Kidde & Co., Inc., Aviation Div.
Stearns-Roger Mfg. Co.
Sun Electric Corp.
Trane Co., The
United Mfg. Co. Div., The W. L. Maxson Corp.
Wells Industies Corp.

COMPRESSORS, GAS

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Cardox Corp.
Champion Pneumatic Machinery Co.
***CORNELIUS CO., THE**
***GARRETT CORP., THE AIRESEARCH MFG. DIVS.**
Haskell Engrg. & Supply Co.
Joy Mfg. Co.
***KAHN & CO., INC.**
Walter Kidde & Co., Inc., Aviation Div.
Nash Engrg. Co., The
Pennsylvania Pump & Compressor Co.
Solar Aircraft Co.
Stearns-Roger Mfg. Co.
Thompson Products, Inc.
Wells Industries Corp.

COMPRESSORS, PORTABLE

Accessory Controls & Equipment Corp.
Air Logistics Corp.
Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Bell & Gossett Co.
Cardox Corp.
Champion Pneumatic Machinery Co.
Continental Aviation & Engrg. Corp.
***CORNELIUS CO., THE**
Devilbiss Co., The
Gardner-Denver Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Joy Mfg. Co.
***KAHN & CO., INC.**
Walter Kidde & Co., Inc., Aviation Div.
Superior Pneumatic & Mfg., Inc.
Wells Industries Corp.

CONDUITS, ELECTRIC

Aluminum Co. of America
American Brass Co., American Metal Hose Div.
Flexaust Co., The
Flexible Metal Hose Mfg. Co.
General Cable Corp.
Hallett Mfg. Co.
Rome Cable Corp.

CONES, SPEAKER

Magnavox Co., The
Waldom Electronics Inc.

CONNECTOR, OXYGEN EQUIPMENT

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Arkwin Industries, Inc.
Aro Equipment Corp., The
Dumont Aircraft Fitting Co.
Essex Mfg. Co., Inc.
Herrick L. Johnston, Inc.
***HOFMAN LABS., INC.**
Progressive Research & Development Co., Inc.

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Aerolite Electronics Corp.
Alden Products Co.
American Brass Co., American Metal Hose Div.
***ANTON ELECTRONIC LABS., INC.**
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Frank W. Morse Co.
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Scintilla Div., Bendix Aviation Corp.
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Winchester Electronics, Inc.

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Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
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Vickers Inc., Div.-Sperry Rand
***WESTINGHOUSE AIR BRAKE CO., INDUST. PRODUCTS DIV.**

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CDC Control Services, Inc.
Devco Engrg. Inc.
Ess Instrument Co.
Merix Chemical Co.
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Thompson Products, Inc.

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Callery Chemical Co.
Patterson, Moos Div.-Universal Winding Co., Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Fluid Conductivity

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CDC Control Services, Inc.
Hydra-Power Corp.
Industrial Instruments Inc.
Leeds & Northrup Co.
Merix Chemical Co.
Systron Corp.

Fluid Flow

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Auburn Spark Plug Co., Inc.
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Barton Instrument Corp.
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Clary Dynamics
Curtiss-Wright Corp., Industrial & Scientific Products Div.
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***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
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Tactair Valve Div.-Aircraft Products Co.
Thompson Products, Inc.
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Vickers Inc., Div.-Sperry Rand
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Waugh Engrg. Co.
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Whittaker Controls, Div.-Telecomputing Corp.

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Illumination

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Electron-Radar Products
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George Ulanet Co.
Reid Metal Products, Inc.
Vickers Inc., Div.-Sperry Rand

Mechanical Switch

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Henry G. Dietz Co., Inc., The
Exact Engrg. & Mfg. Inc.
Ideal-Aerosmith, Inc.
***KAHN & CO., INC.**
J. A. Maurer, Inc.
United Control Corp.

Motor & Generator Communications

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Bowmar Instrument Corp.
Cutler-Hammer Inc.
Hammett Electric Co.
Hertner Electric Co., The
Leach Corp.
Varo Mfg. Co.

Motor & Generator, Industrial

Aircraft Equipment Div.-Consolidated Diesel Electric Corp.

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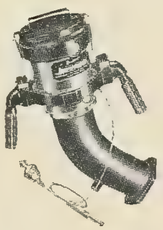
FUEL SERVICING

ADAPTERS

- Tapered seat, self-centering, cannot cock. Internal contour provides *maximum flow with minimum pressure loss.*
- Provide the most efficient form of connection for single point fueling.
- Type A-5, with one of several variable housings shown. Types A-2, A-3, A-4, and A-6 also available.
- All adapters meet General Specification MIL-A-6425A.



COUPLING VALVES

- Self-sealing coupling valves mate with adapters shown above to make positive leakproof connection for transfer of fuel. Full flow, minimum pressure drop.
- Valve can be connected or disconnected under pressure without loss of fuel.
- Type D-1, illustrated, meets Specification MIL-N-5877A.
- Other styles available.

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Hertner Electric Co., The
Leach Corp.
Northwestern Electric Co.
Teletronic Labs., Inc.
Varo Mfg. Co.
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Oxygen

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Barton Instrument Corp.
A. W. Cash Co.
Clary Dynamics
Fischer & Porter Co.
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General Controls Co.
*WALLACE O. LEONARD, INC.
Pioneer-Central Div., Bendix Aviation Corp.
Puritan Compressed Gas Corp., Aviation Div.
Whittaker Controls, Div.-Telecomputing Corp.

X-Ray

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CDC Control Services, Inc.

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American Television & Radio Co.
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Avion Div., ACF Industries, Inc.
Bendix Aviation Corp., Red Bak Div.
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Eicor Div.-F. L. Jacobs Co.
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Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
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Hertner Electric Co., The
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Redmond Co., Inc.
Southwestern Industrial Electronics Co.
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Varo Mfg. Co.
Vibration Research Labs., Inc.
Wickes Engrg. & Construction Co., Inc
Wincharger Corp.

Ac-Dc

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Aircraft Products Div.-Cline Electric Mfg. Co.
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Amelco, Inc.
American Research & Mfg. Corp.
American Television & Radio Co.
Arnoux Corp.
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Eicor Div.—F. L. Jacobs Co.
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General Nuclear Corp.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
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Hammett Electric Co.
Hertner Electric Co., The
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
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*MOTOR GENERATOR CORP.
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Northwestern Electric Co.
Opad Electric Co.
*RHEEM MFG. CO., ELECTRONICS DIV.
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Telkor, Inc.
Transistor Devices, Inc.
Ultradyne, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wickes Engrg. & Construction Co., Inc.
Wincharger Corp.

Dc-Ac

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Airborne Accessories Corp.
Louis Allis Co., The
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Amelco, Inc.
American Research & Mfg. Corp.
American Television & Radio Co.
Arnoux Corp.
*AVCO MFG. CORP., CROSLEY DIV.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electronic Techniques, Inc.
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Hammett Electric Co.
Hertner Electric Co., The
Hoover Electric Co.
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Jordan Electronics, Div.-Victoreen Instrument Co.
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Kurz & Root Co.
Leach Corp.
M F Electronics Co.
Magnovox Co., The
Maico Electronics, Inc.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Missile Engrg. Products, Inc.
*MOTOR GENERATOR CORP.
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Northwestern Electric Co.
Opad Electric Co.
Redmond Co., Inc.
Sangamo Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Telkor, Inc.
Transistor Devices, Inc.
Ultradyne, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
*WESTINGHOUSE ELECTRIC CORP.
Wickes Engrg. & Construction Co., Inc.
Wincharger Corp.

Fm Communications

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*AVCO MFG. CORP., CROSLEY DIV.
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Hammett Electric Co.
International Crystal Mfg. Co., Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Varo Mfg. Co.

Frequency, Measurement & Test

Bendix Aviation Corp., Red Bank Div.
Consolidated Avionics Corp.
*COOPER DEVELOPMENT CORP.
Georator Corp.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
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George L. Nankervis Co.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Stromberg-Carlson, Electronics Div.
Sun Electric Corp.
Systron Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Varo Mfg. Co.
Waugh Engrg. Co.

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Arnoux Corp.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Consolidated Avionics Corp.
Electronic Techniques, Inc.
J. W. Fecker, Inc., Sub.-American Optical Co.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Hallamore Electronics Co.
*INTERELECTRONICS CORP.
Leach Corp.
Motordyne, Inc.
Northwestern Electric Co.
Opad Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Varo Mfg. Co.

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Aro Equipment Corp., The
D K Mfg. Co.
Herrick L. Johnston, Inc.
Kelsey-Hayes Co.
Pioneer-Central Div., Bendix Aviation Corp.
Stearns-Roger Mfg. Co.

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Chiksan Co.
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Dial Products Co.
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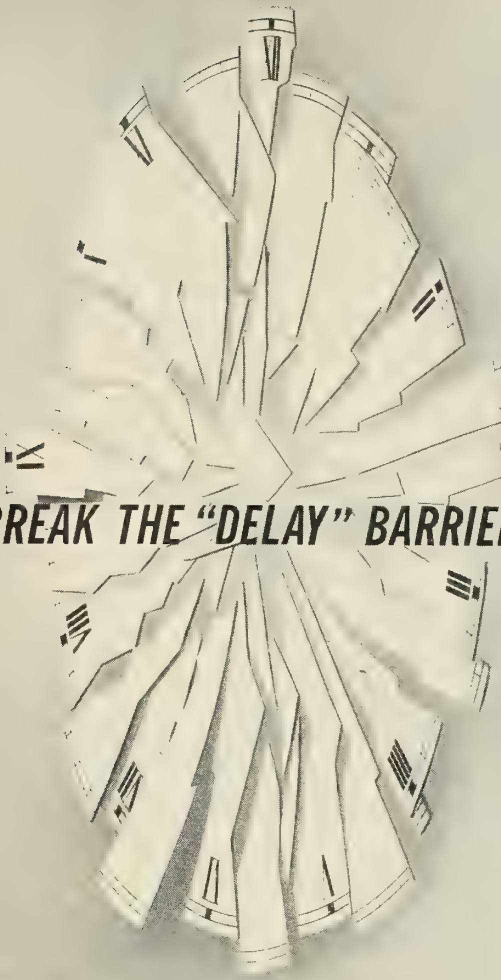

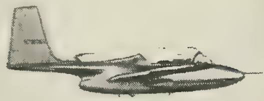

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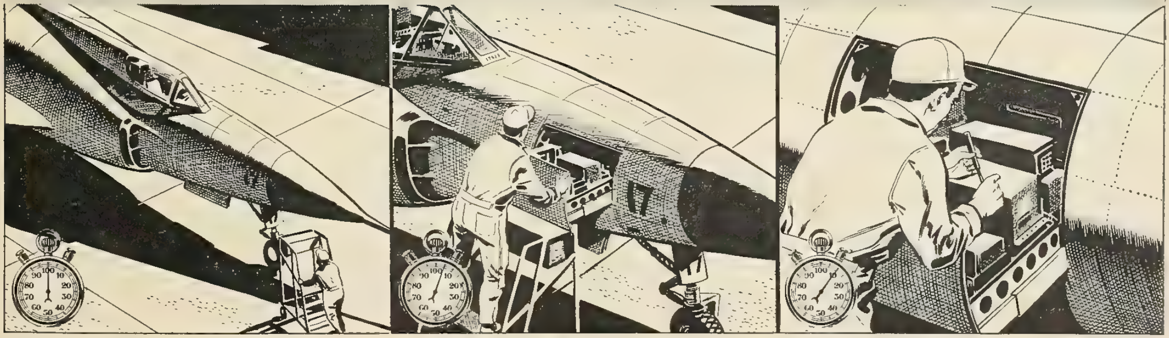

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Penn-Michigan Mfg. Corp.
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Shaw Metal Products Corp.
Solar Aircraft Co.
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Thieblot Aviation Co., Div.-Vitro Corp. of America
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United Mfg. Co., The
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Wright Aeronautical Div., Curtiss-Wright Corp.

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Devilbiss Co., The
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International Aerocoustics Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
R. C. Mahon Co., The
Muckle Mfg. Co.
Penn-Michigan Mfg. Corp.
Portland Copper & Tank Works, Inc.
Ryan Aeronautical Co.
Solar Aircraft Co.
Stainless Steel Products, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Wright Aeronautical Div., Curtiss-Wright Corp.

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Muckle Mfg. Co.
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Air Logistics Corp.
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Aircraft Equipment Div.-Consolidated Diesel Electric Corp.
Aircraft Mechanics, Inc.
Aircraft Standards, Inc.
American Brass Co., American Metal Hose Div.
American Car & Foundry Div., ACF Industries, Inc.
American Research & Mfg. Corp.
Anderson, Greenwood & Co.
Applied Design Co.
Arkwin Industries, Inc.
Arnolt Corp.
Associated Co., Inc.
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Goodyear Aircraft Corp.
***GREER HYDRAULICS, INC.**
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Ludwig Honold Mfg. Co.
International Fermont Machinery Co., Inc.
Herrick L. Johnston, Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kaiser Steel Corp., Fabricating Div.
Kellett Aircraft Corp.
Leach Corp.
Loewy-Hydropress, Div.-Baldwin-Lima-Hamilton
Lukens Steel Co.
Machine Engrg. Co., Inc.
Macks Trucks, Inc., Govt. Div.
R. C. Mahon Co., The
W. L. Maxson Corp., The
Milman Engrg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Modglin Co., Inc.
Nuclear Products-Erco., Div.-ACF Industries, Inc.
O & M Machine Co., Inc.
Parish Pressed Steel., Div.-Dana Corp.
Philco Corp., Government & Industrial Divs.
Philips & Davies, Inc.
Polarad Electronics Corp.
Reeves Instrument Corp.
***REGENT JACK MFG. CO., INC.**
Republic Aviation Corp., Guided Missiles Div.
***RHEEM MFG. CO., AIRCRAFT DIV.**
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CO.**
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Ryan Aeronautical Co.
***RYAN INDUSTRIES**
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Shaw Metal Products Corp.
Solar Aircraft Co.
Standard Armament, Inc.
Sun Electric Corp.
Stanley Aviation Corp.
Technical Oil Tool Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson Products, Inc.
***TRAILMOBILE, INC.**
United Mfg. Co., The
United States Chemical Milling Corp.
Vard, Inc.
Vickers, Inc., Div.-Sperry Rand
***VICKERS, INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Warren Mfg. Div., Warren Brothers Roads Co.
Washington Technological Associates, Inc.
Wells Industries Corp.
Wheland Co., The
Wickfield, Inc.
Winder Aircraft Corp. of Fla.

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American Rocket Co.
Atlantic Research Corp.
Auburn Spark Plug Co., Inc.
B G Corp., The
Bendix Products Div., Bendix Aviation Corp.
Boston Insulated Wire & Cable Co.
Carleton Aviation Co., Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Electric Auto-Lite Co., The
*JANITROL AIRCRAFT DIV.-SURFACE COMBUSTION CORP.
Kurz & Root Co.
J. E. Menaugh Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
Propellex Chemical Corp.
Scintilla Div., Bendix Aviation Corp.
Twix Mfg. Co., Inc.
Winder Aircraft Corp. of Fla.

IGNITION ASSEMBLIES, SOLID ROCKETS

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Atlantic Research Corp.
Auburn Spark Plug Co., Inc.
Beaton & Corbin Mfg. Co., The
Beckman & Whitley, Inc., Missile Products Div.
*COOPER DEVELOPMENT CORP.
*DIVERSEY ENGRG. CO.
McCormick Selph Associates
J. E. Menaugh Co.
Propellex Chemical Corp.
Resdel Corp.
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.
Titeflex, Inc.
Turbo Dynamics Corp.

LADDERS, FUELING

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Associated Co., Inc.
Basic Tool Industries, Inc.
Bil-Jax, Inc.
Champion Airquipment Inc.
C. B. Christiansen Co.
Cromer Mfg. & Engrg., Inc.
Duo-Safety Ladder Corp.
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Schaffer Air Industries, Inc.
Shaw Metal Products Corp.
South River Metal Products Co., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Wells Industries Corp.

LAUNCHING PLATFORMS

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All American Aircraft Products, Inc.
American Car & Foundry Div., ACF Industries, Inc.
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Applied Design Co.
Atlantic Research Corp.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Basic Tool Industries, Inc.
Bil-Jax, Inc.
Champion Airquipment Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
*COOPER DEVELOPMENT CORP.
Cromer Mfg. & Engrg., Inc.
Danly Machine Specialties, Inc.
G. M. Dykes Iron Works, Inc.
Dynametrics Corp.
Food Machinery & Chemical Corp., Ordnance Div.
Four Wheel Drive Auto Co., The
*FRUEHAUF TRAILER CO.
G. W. Galloway Co.
Irving Air Chute Co., Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Loewy-Hydropress, Div.-Baldwin-Lima-Hamilton
Lukens Steel Co.
Luria Engrg. Co.
R. C. Mahon Co., The
McDowell Co., Inc.
Opelika Welding, Machine, & Supply Inc.
Parish Pressed Steel, Div.-Dana Corp.
Peterson & Neville, Inc.
Philips & Davies Inc.
Reeves Instrument Corp.
*REGENT JACK MFG. CO., INC.
Reich Brothers Mfg. Co., Inc.
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Minneapolis-Honeywell Regulator Co., Industrial Div.
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***WESTINGHOUSE ELECTRIC CORP.**

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Walter Kidde & Co., Inc., Aviation Div.
Mine Safety Appliances Co.
J. J. Monaghan Co., Inc.
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Pioneer-Central Div., Bendix Aviation Corp.
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Scott Aviation Corp.
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ARO Equipment Corp., The
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***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
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Herrick L. Johnston, Inc.
Walter Kidde & Co., Inc., Aviation Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
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Pioneer-Central Div., Bendix Aviation Corp.
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Luria Engrg. Co.
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Pitman Mfg. Co.
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South River Metal Products Co., Inc.
United Mfg. Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
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Wells Industries Corp.
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Lapp Insulator Co., Inc., Radio Specialties Div.
Gerard G. Leeds Co., Inc.
National Airoil Burner Co.
New York Air Brake Co., The, Watertown Div.
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Milton Roy Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
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Vickers Inc., Div.-Sperry Rand
Wayne Pump Co., The

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Kemp Aero Products, Div.-Kemp Inc.
Pesco Products Div.-Borg-Warner Corp.
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Superior Air Products Co.
Task Corp.
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Whittaker Gyro, Div.-Telecomputing Corp.

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Kemp Aero Products, Div.-Kemp Inc.
Presco Products Div.-Borg-Warner Corp.
Reaction Motors, Inc.
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Superior Air Products Co.
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Whittaker Controls, Div.-Telecomputing Corp.
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Kemp Aero Products, Div.-Kemp Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
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Pyles Industries, Inc.
Research Appliance Co.
Milton Roy Co.
Sundstrand Aviation Div.-Sundstrand Machine Tool Co.
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***CORNELIUS CO., THE**
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Gardner-Denver Co.
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M. C. Mfg. Co.
Nash Engrg. Co., The
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Superior Pneumatic & Mfg., Inc.
Task Corp.
Thompson Products, Inc.
Whittaker Controls, Div.-Telecomputing Corp.
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Reaction Motors, Inc.
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Sundstrand Turbo Div., Sundstrand Machine Tool Co.
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*UNITED AIRCRAFT PRODUCTS, INC.
Wayne Pump Co., The
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Whittaker Gyro, Div.-Telecomputing Corp.

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Stratos, Div.-Fairchild Engine & Airplane Corp.
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Litton Engrg. Labs.
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Milton Roy Co.
Task Corp.
Thompson Products, Inc.
Whittaker Controls, Div.-Telecomputing Corp.

Vacuum

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Consolidated Electrodynamics Corp.
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Arnoux Corp.
Automatic Electric Sales Corp.
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Electro-Miniature Corp.
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*A. W. HAYDON CO., THE
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Seeburg Corp., The
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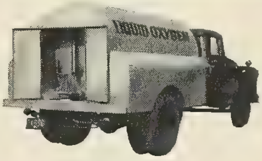

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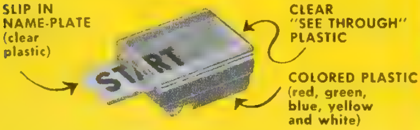
3 UNITS IN 1 COMPACT MOUNTING

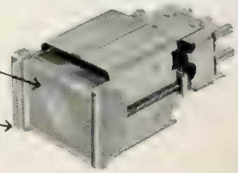
NAME-PLATE + PILOT-LIGHTS + PUSH-BUTTON SWITCH UNIT

In one compact assembly, this unit provides new space and cost economy whether used individually or in "stacked" arrangement. You get quality appearance with "thumb-size" operation.

TWO-PIECE, PLASTIC NAME-PLATE PROVIDES EASY COLOR-CODING; SIMPLIFIES OPERATION IDENTIFICATION


SLIP IN NAME-PLATE (clear plastic)
START
CLEAR "SEE THROUGH" PLASTIC
COLORED PLASTIC (red, green, blue, yellow and white)

Virtually any operating condition can be identified with this push-button name-plate arrangement. The snap-in button is easily removed for insertion of slip-in name-plate. Use of various colored button bases, or various colored lamps, permits wide range of codings and monitoring.

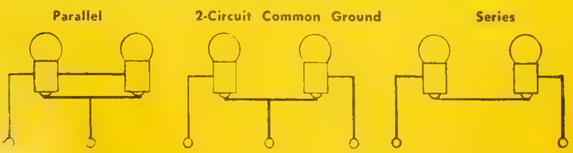


- Snap-in button permits easy lamp replacement from front of panel
- Barrier can be color-anodized to your specification

The lighted push-button switch assembly is also available without the switch unit for use where only pilot light duty is required.

VARIETY OF CIRCUIT ARRANGEMENTS PERMITS WIDE RANGE OF INDICATING AND SWITCHING COMBINATIONS

- Lamp circuit can be wired independently of switch circuit—or through switch unit.
- Since two lamps are provided, independent external circuits can be indicated on single unit with different lamp colors and white push-button.
- Complete push-button switch unit or pilot-light assembly can be supplied in any of the three following circuit arrangements.

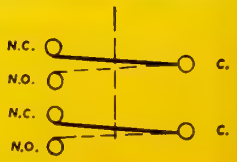


- 6V. or 28V. lamps may be used (solder terminals on lamp assembly)

Switch terminals available
- Solder
- Turret
- Double Turret
- AMP quick-disconnect

Switching Circuits to Meet Your Needs

The double-pole, double-throw switching unit may be wired normally-open or normally-closed.



a standard ELECTRO-SNAP UNIT

- Compact
- Space Saving
- Precision-Engineered
- Low Cost

GUIDANCE EQUIPMENT

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PHOTO ON GUIDANCE EQUIPMENT DIVIDER PAGE: Nike acquisition antenna, being studied by students at the Ordnance Guided Missile School, has an interior containing a highly complex mass of electronics wires and tubes.

. . . guidance

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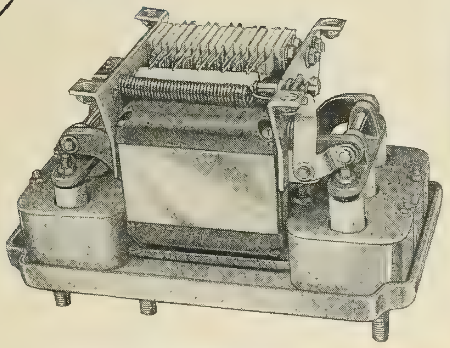

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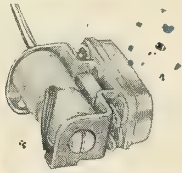
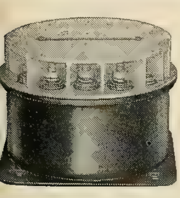
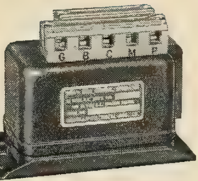
0v. 400c static overvoltage relay



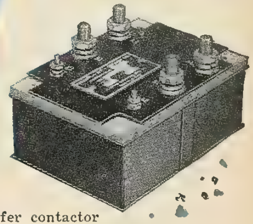
Control Relay — SPDT — Hermetically sealed contacts



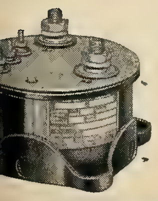
amp. 3PDT — Hermetically led transfer contactor



Hermetically sealed field control relay



200 amp. SPDT — transfer contactor



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Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tempo Instrument Inc.
Tensor Electric Development Co., Inc.
Topper Mfg. Co., Inc.
Tresco, Inc.
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American Research & Mfg. Corp.
Analogue Controls, Inc.
Bendix Aviation Corp., York Div.
Communications Co.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Daven Co., The
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Associates, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Precision Lab. Inc.
Goodyear Aircraft Corp.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Haller Raymond & Brown Inc.
Keithley Instruments, Inc.
Lear, Inc., Grand Rapids Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Line, Audio

Amplifier Corp. of America
J. H. Bunnell & Co.
Communications Co.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Doty Acoustica Electronic Labs.
Du Kane Corp.
Dunlap Electronics, Inc.
Empire Products Sales Corp.
Haller Raymond & Brown Inc.
Highland Engrg. Co.
***INTERELECTRONICS CORP.**
Keystone Products Co.
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Lytle Engrg. & Mfg. Co.
Magnasync Mfg. Co., Ltd.
Munston Mfg. & Service, Inc.
Orbitran Co., Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Varo Mfg. Co.
Wickes Engrg. & Construction Co. Inc.

Magnetic

Acromag Inc.
Advance Industries, Inc.
Airborne Accessories Corp.
American Research & Mfg. Corp.
Bogue Electric Mfg. Co.
Burroughs Corp.
Canoga Corp. of California
Cedar Engrg. Div.-Control Data Corp.
Consolidated Controls Corp.
D & R, Ltd.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Empire Products Sales Corp.
Engineered Magnetics, Div.-Gulton Industries, Inc.
Fairfield Engineering Corp.
Feedback Controls, Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Magnetics, Inc.
General Precision Lab. Inc.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Industrial Control Co.
***INTERELECTRONICS CORP.**
J-V-M Microwave Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kearfott Co., Inc.
Keystone Products Co.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Lumen, Inc.
Magnetico, Inc.
NYT Electronics, Inc.
Ortho Filter Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Ryan Aeronautical Co.
Sangamo Electric Co.
Saratoga Industries
Servomechanisms, Inc.
Southwestern Industrial Electronics Co.
Specialties, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Thompson Products, Inc.
Transformers, Inc.
Tresco, Inc.
United Control Corp.
United Transformer Corp.
Vap-Air Div., Vapor Heating Corp.
Vari-L Co., Inc.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Westbury Electronics Inc.
Westinghouse Electric Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Wickes Engrg. & Construction Co. Inc.

Microwave

Advance Industries, Inc.
Aircom Inc.
Airtron, Inc.
Alfred Electronics
Amerac Inc.
Bendix Aviation Corp., York Div.
Canoga Corp. of California
***COOPER DEVELOPMENT CORP.**
Daven Co., The
Demornay-Bonardi
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Empire Products Sales Corp.
Farnsworth Electronics Co., Div.—Int'l Telephone & Telegraph Corp.
Thomas T. Fox Co.
Geisler Labs.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Kearfott Co., Inc.
La Pointe Industries Inc.
W. L. Maxson Corp., The
Microwave Development Labs., Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
RS Electronics Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Stavid Engrg., Inc.
Technical Oil Tool Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Thompson Products, Inc.
Uniwave, Inc.
Waveline, Inc.
Wave Particle Corp.
Westbury Electronics Inc.
Wunderlich Radio Co.

Mixing, R-F

Aircom Inc.
Amelco, Inc.
Bendix Aviation Corp., York Div.
Blonder-Tongue Labs., Inc.
Canoga Corp. of California
Communications Co.
***DATA-CONTROL SYSTEMS INC.**
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General Instrument Corp., Defense Products Div.
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Goodyear Aircraft Corp.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
L E L, Inc.
Microwave Development Labs., Inc.
Munston Mfg. & Service, Inc.
Patterson, Moos Div.—Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Reeves Instrument Corp.
Standard Electronics Div., Radio Engrg. Labs. Inc.
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Telectro Industries Corp.
Wave Particle Corp.
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Mobile

Amelco, Inc.
Communications Co.
Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
Patterson, Moos Div.—Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.

Noise-Suppressing

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Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
La Pointe Industries Inc.
Patterson, Moos Div.—Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Western Electro-Acoustic Lab.

Operational

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Amelco, Inc.
American Electronics, Inc., Data-Tronics Div.
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Electronic Associates, Inc.
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Goodyear Aircraft Corp.
Hallamore Electronics Co.
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***INTERELECTRONICS CORP.**
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La Pointe Industries Inc.
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Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Boston Div.
Patterson, Moos Div.—Universal Winding Co., Inc.
George A. Philbrick Researches, Inc.
Philco Corp., Government & Industrial Divs.
Servomechanisms, Inc.
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Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Photocell

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Doty Acoustica Electronic Labs.
Dunlap Electronics, Inc.
Eldorado Electronics
Electric Eye Equipment Co.
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***INTERELECTRONICS CORP.**
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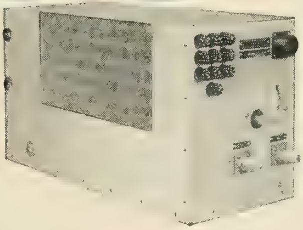
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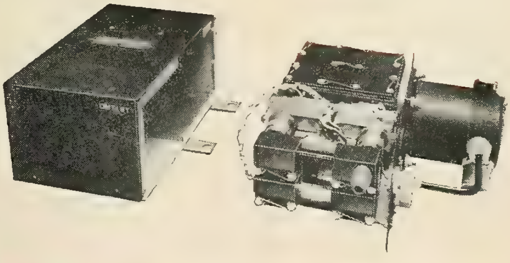
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Canoga Corp. of California
Cleveland Metal Specialties Co.
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Du Kane Corp.
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Goodyear Aircraft Corp.
Gray Mfg. Co., The
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Industrial Control Co.
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Stavid Engrg., Inc.
Telectro Industries Corp.
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United-Carr Fastener Corp.
Walkirt Co.
Westbury Electronics Inc.

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Avien, Inc.
Barber-Colman Co.
Barnes Development Co.
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Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
CDC Control Services, Inc.
Canoga Corp. of California
Cedar Engrg. Div.-Control Data Corp.
Collins Radio Co.
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Fidelity Instrument Corp.
Ford Instrument Co., Div.—Sperry Rand Corp.
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Hanson-Gorrill-Brian, Inc.
Industrial Control Co.
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Gerard G. Leeds Co., Inc.
Librascope Inc.
J. A. Maurer, Inc.
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Ryan Aeronautical Co.
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Servomechanisms, Inc., Mechatrol Div.
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Southwestern Industrial Electronics Co.
Stavid Engrg., Inc.
Telectro Industries Corp.
Tempo Instrument Inc.
Theta Instrument Corp.
Topper Mfg. Co., Inc.
United Control Corp.
Varo Mfg. Co.
Wacline, Inc.
Westbury Electronics Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Weston Hydraulics, Ltd.

Single-Sideband

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Electronic Communications, Inc.
Geisler Labs.
Gray Mfg. Co., The
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Hycon Eastern Inc.
Industrial Television Inc.
E. F. Johnson Co.
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Lane Electronics Mfg. Corp.
Munston Mfg. & Service, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
RS Electronics Corp.
Ryan Aeronautical Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Wave Particle Corp.
Westinghouse Electric Corp.

Transistor

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
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Airtron, Inc.
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Bulova Watch Co., Electronics Div.
Burroughs Corp.
Chesapeake Instrument Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Curtiss-Wright Corp., Electronics Div.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
*DATA-CONTROL SYSTEMS INC.
Daven Co., The
Davenport Mfg. Co.
Doty Acoustica Electronic Labs.
Du Kane Corp.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Associates, Inc.
Electrosolids Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Engineered Magnetics, Div.-Gulton Industries, Inc.
Fairfield Engineering Corp.
Feedback Controls, Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
Goodyear Aircraft Corp.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
Industrial Control Co.
Instrument Laboratories
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Kay Electric Co.
Keithley Instruments, Inc.
Kelsey-Hayes Co.
Kin Tel Div.-Cohu Electronics, Inc.
Lear, Inc., Grand Rapids Div.
L E L, Inc.
Librascope Inc.
M F Electronics Co.
Magnavox Co., The
Minneapolis-Honeywell Regulator Co., Boston Div.
Motordyne Inc.
NYT Electronics, Inc.
Orbitran Co., Inc.
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Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Precision, Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Servomechanisms, Inc., Mechatrol Div.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Technical Oil Tool Corp.
Telectro Industries Corp.
Tempo Instrument Inc.
Tensor Electric Development Co., Inc.
Trans Electronics, Inc.
Ultradyne, Inc.
United Control Corp.
United Electrodynamics, Div.-United Geophysical Corp.
Vap-Air Div., Vapor Heating Corp.
Varo Mfg. Co.
Walkirt Co.
Westbury Electronics Inc.
Westinghouse Electric Corp.

Ultrasonic

Alcar Instruments, Inc.
Arenberg Ultrasonic Laboratory, Inc.
Atlantic Research Corp.
Haller Raymond & Brown Inc.
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Keithley Instruments, Inc.
M F Electronics Co.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Vibration Pickup

Advanced Electronics, Inc.
Allegany Instrument Co., Inc.
American Research & Mfg. Corp.
Atlantic Research Corp.
Brush Instruments, Div.-Clevite Corp.
Columbia Research Labs.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Endevco Corp.
Epsco Inc.
Erwood Inc.
Gulton Industries, Inc.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Keithley Instruments, Inc.
M F Electronics Co.
Patterson, Moos Div.-Universal Winding Co., Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
United Electrodynamics, Div.-United Geophysical Corp.
Videon Electronic Corp.
Western Electro-Acoustic Lab.

ANALYZERS

Advance Industries, Inc.
Barnes Development Co.
Bogue Electric Mfg. Co.
Brush Instruments, Div.-Clevite Corp.
Consolidated Avionics Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
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California Technical Industries, Div.-Textron Inc
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James Cunningham Son & Co., Inc.
Dit-Mco, Inc., Electronics Div.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
General Electric Co., Apparatus Sales Div.
Haller Raymond & Brown Inc.
Instrument Laboratories
Kay Electric Co.
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Philco Corp., Government & Industrial Divs.
Precision Apparatus Co., Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Sun Electric Corp.
Telectro Industries Corp.
Ultradyne, Inc.

Differential

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Dynamic Gear Co., Inc.
General Electric Co., Apparatus Sales Div.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Librascope Inc.
Mid-Century Instrumatic Corp.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Phase

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Brush Instruments, Div.-Clevite Corp.
General Electric Co., Apparatus Sales Div.
Haller Raymond & Brown Inc.
North Atlantic Industries, Inc.
Panoramic Radio Products, Inc.
Philco Corp., Government & Industrial Divs.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Varo Mfg. Co.

Servo

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Brush Instruments, Div.-Clevite Corp.
CDC Control Services, Inc.
Canoga Corp. of California
Exact Engrg. & Mfg. Inc.
Gray Instrument Co.
Haller Raymond & Brown Inc.
Industrial Control Co.
Kearfott Co., Inc.
North Atlantic Industries, Inc.
Librascope Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Strata Instrument Co.
Telectro Industries Corp.
Theta Instrument Corp.

Transducer

Advance Industries, Inc.
American Electronics, Inc.
Clark Electronic Laboratories
Computer Instruments Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Hallamore Electronics Co.
Massa Labs., Inc.
Orbitran Co., Inc.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Ultradyne, Inc.
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Coaxial Connector Co. Inc.
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Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Dittmore-Freimuth Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Gabriel Co., The Gabriel Electronics Div.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Hi-Lo Manufacturing Corp.
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D. S. Kennedy & Co.
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Motorola Inc., Military Marketing Div.
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Shaw Metal Products Corp.
Specific Products
Technical Appliance Corp.
Terminal Radio Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Transco Products, Inc.
Tricraft Products Corp.
Uniwave, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Waveguide, Inc.
Wind Turbine Co.

ANTENNA TUNING UNITS

Advance Industries, Inc.
Airtron, Inc.
American Electronic Labs., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Andrew Corp.
Canoga Corp. of California
Collins Radio Co.
Communications Co.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Dayton Aircraft Products, Inc.
Diamond Antenna & Microwave Corp.
Don-Lan Electronics Co.
Empire Products Sales Corp.
General Instrument Corp., Defense Products Div.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
E. F. Johnson Co.
La Pointe Industries Inc.
Lear, Inc.
Prodelin Inc.
Radar Design Corp.
Technical Appliance Corp.
Tellectro Industries Corp.
Terminal Radio Corp.
Wilcox Electric Co., Inc.
Wunderlich Radio Co.

ATTENUATORS, AUDIO

Clarostat Mfg. Co., Inc.
Corning Glass Works
Daven Co., The
Dayton Aircraft Products, Inc.
Dittmore-Freimuth Corp.
Dmeter Mfg. Co., Inc.
Dunlap Electronics, Inc.
General R-F Fittings, Inc.
Haller Raymond & Brown Inc.
Kay Electric Co.
Orbitran Co., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

ATTENUATORS, MICROWAVE

Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Applied Research Inc.
Bogart Mfg. Corp.
Canoga Corp. of California
Coaxial Connector Co. Inc.
Corning Glass Works
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Dittmore-Freimuth Corp.
Douglas Microwave Co., Inc.
Electro Impulse Lab., Inc.
Electron-Radar Products
Elektro-Serv Co.
Empire Products Sales Corp.
General Communication Co.
General Instrument Corp., Defense Products Div.
General R-F Fittings, Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Hansen Electronics Co.
J-V-M Microwave Co.
McMillan Industrial Corp.
Metavac, Inc.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Omega Labs., Inc.
Polarad Electronics Corp.
Radar Design Corp.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Sanders Associates, Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.
Thompson Products, Inc.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.
Waveguide, Inc.
Weinschel Engrg.

ATTENUATORS, PRECISION

Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Canoga Corp. of California
Corning Glass Works
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Dittmore-Freimuth Corp.
Dmeter Mfg. Co., Inc.
Douglas Microwave Co., Inc.
Electronic Associates, Inc.
Empire Products Sales Corp.
General Communication Co.
General R-F Fittings, Inc.
Haller Raymond & Brown Inc.
Kay Electric Co.
La Pointe Industries Inc.
Leeds & Northrup Co.
Metavac, Inc.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Radar Design Corp.
Sage Laboratories, Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Weinschel Engrg.

ATTENUATORS, R-F & I-F

Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Applied Research Inc.
Arenberg Utrasonic Laboratory, Inc.
BJ Electronics, Borg-Warner Corp.
Blonder-Tongue Labs., Inc.

Canoga Corp. of California
Coaxial Connector Co. Inc.
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Elektro-Serv Co.
Empire Products Sales Corp.
Entron, Inc.
Fugle-Miller Labs Inc
General Communication Co.
General Instrument Corp., Defense Products Div.
General R-F Fittings, Inc.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Kay Electric Co.
Metavac, Inc.
Microlab
Radar Design Corp.
Telectro Industries Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Uniwave, Inc.
Weinschel Engrg.

ATTITUDE

***COOPER DEVELOPMENT CORP.**
Iron Fireman Mfg. Co., Electronics Div.
Kearfott Co., Inc.
Sanders Associates, Inc.

AUTOMATIC PILOT CONTROL VALVES

CDC Control Services, Inc.
Cadillac Gage Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Javelin Aircraft Co. Inc.
Kearfott Co., Inc.
Lear, Inc.
Pacific Div.-Bendix Aviation Corp.
Research Controls
Sanders Associates, Inc.
Servomechanisms, Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

AUTOMATIC PILOTS, ELECTRONIC

American Research & Mfg. Corp.
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Dwyer Engrg. Co., Inc.
Dynavia Engrg. Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Globe Industries, Inc.
Goodyear Aircraft Corp.
Hallamore Electronics Co.
Javelin Aircraft Co. Inc.
Kearfott Co., Inc.
Lear, Inc.
Librascope Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Ryan Aeronatuical Co.
Sanders Associates, Inc.
Sargent Engrg. Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Westinghouse Electric Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

AUTOMATIC PILOTS, HYDRAULIC

American Research & Mfg. Corp.
Autonetics, Div.-North American Aviation, Inc.
CDC Control Services, Inc.
Collins Engrg. Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Goodyear Aircraft Corp.
Hydra-Power Corp.
Javelin Aircraft Co. Inc.
Kearfott Co., Inc.
Kelsey-Hayes Co.
Ryan Aeronautical Co.
Sargent Engrg. Corp.
Servomechanisms, Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

BALL LATCHES

Engineered Products Co., The
O & M Machine Co., Inc.

BASES, TRANSISTOR

Motorola Inc., Military Marketing Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Ray-O-Vac Co., Div.-Electric Storage Battery Co.

BATTERIES

Carbone Corp., The
Eagle-Picher Co., The
Electric Auto-Lite Co., The
***EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.**
Patterson, Moos Div.-Universal Winding Co., Inc.
Terminal Radio Corp.
Willard Storage Battery Div.

Atomic

Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United States Radium Corp.

Mercury

Magnavox Co., The
P. R. Mallory & Co. Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Terminal Radio Corp.

Nickel Alkaline

Terminal Radio Corp.

Nickel-Cadmium

Eagle-Picher Co., The
***EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.**
Terminal Radio Corp.

Nuclear

Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United States Radium Corp.

Silver

Frank R. Cook Co.
Goldsmith Brothers Smelting & Refining Co.
Terminal Radio Corp.
Willard Storage Battery Div.

Silver Zinc

***AMERICAN MACHINE & FOUNDRY CO.**
Frank R. Cook Co.
Eagle-Picher Co., The
***EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.**
Ray-O-Vac Co., Div.-Electric Storage Battery Co.
Terminal Radio Corp.
Willard Storage Battery Div.
Yardney Electric Corp.

Transistor

P. R. Mallory & Co. Inc.
Monarch Aircraft Sales, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Yardney Electric Corp.

BEARINGS

Barden Corp., The
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Collins Engrg. Corp.
Dodge Mfg. Corp.
Federal Bearings Co. Inc., The
Gwilliam Co., The
Industrial Tectonics, Inc.
Joclin Mfg. Co.
Kaydon Engrg. Corp., The
Marlin-Rockwell Corp.
Miniature Precision Bearings, Inc.
Monarch Aircraft Sales, Inc.
Raway Bearing Co.
Raybestos-Manhattan, Inc.
SKF Industries, Inc.
St. Marys Carbon Co.
Torrington Co., The
United Supply Co.

Ball Miniature

Barden Corp., The
Marlin-Rockwell Corp.
Miniature Precision Bearings, Inc.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Raway Bearing Co.
United Supply Co.

Jewel

Richard H. Bird & Co., Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Moser Jewel Co.
Monarch Aircraft Sales, Inc.
United Supply Co.

Needle

Hamilton Watch Co., Military Products Div.
Industrial Tectonics, Inc.
Moser Jewel Co.
Kaydon Engrg. Corp., The
McGill Mfg. Co. Inc.
Monarch Aircraft Sales, Inc.
Orange Roller Bearing Co., Inc.
Raway Bearing Co.
Roller Bearing Co. of America
Torrington Co., The
United Supply Co.

Oiless

Amplex Div.-Chrysler Corp.
Bound Brook Oil-Less Bearing Co.
***GRAPHITE METALLIZING CORP.**
Walter K. Jaros, Aircrafters
Keystone Carbon Co.
Monarch Aircraft Sales, Inc.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Pure Carbon Co. Inc.
Randall Graphite Bearings, Inc.
Raybestos-Manhattan, Inc.
St. Marys Carbon Co.
Southwest Products Co.
United Supply Co.

Rod End

Chain Belt Co.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Freeman Co., The
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Marlin-Rockwell Corp.
Monarch Aircraft Sales, Inc.
Raway Bearing Co.
Southwest Products Co.
United Supply Co.

Roller

Chain Belt Co.
Dodge Mfg. Corp.
Gwilliam Co., The
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Marlin-Rockwell Corp.
Monarch Aircraft Sales, Inc.
Orange Roller Bearing Co., Inc.
Raway Bearing Co.
Roller Bearing Co. of America
Rollway Bearing Co., Inc.
SKF Industries, Inc.
Torrington Co., The
United Supply Co.

Roller Taper

Dodge Mfg. Corp.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Monarch Aircraft Sales, Inc.
SKF Industries, Inc.
Timken Roller Bearing Co., The
Torrington Co., The
United Supply Co.

Self Aligning

Amplex Div.-Chrysler Corp.
Barden Corp., The
Bound Brook Oil-Less Bearing Co.
Carbone Corp., The
Chain Belt Co.
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Dodge Mfg. Corp.
Federal Bearings Co. Inc., The
***GRAPHITE METALLIZING CORP.**
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Kaydon Engrg. Corp., The
Keystone Carbon Co.
Monarch Aircraft Sales, Inc.
Randall Graphite Bearings, Inc.
Raway Bearing Co.
SKF Industries, Inc.
St. Marys Carbon Co.
Southwest Products Co.
Torrington Co., The
United Supply Co.

Special Purpose

Barden Corp., The
Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
J. W. Fecker, Inc., Sub-American
Federal Bearings Co. Inc., The
Halax Corp.
Industrial Tectonics, Inc.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Kaydon Engrg. Corp., The
Marlin-Rockwell Corp.
Miniature Precision Bearings, Inc.
Monarch Aircraft Sales, Inc.
Ohio Carbon Co., The
Raway Bearing Co.
St. Marys Carbon Co.
Southwest Products Co.
Split Ballbearing, Div.-MPB
Technical Oil Tool Corp.
Torrington Co., The
United Supply Co.

BELLOWS

Allied Plastics Supply Corp.
Barton Instrument Corp.
Clary Dynamics

. . . guidance

Emerson Plastics Corp.
Enflo Corp.
Flexible Metal Hose Mfg. Co.
Glassco Instrument Co.
B. F. Goodrich Aviation Products
J. J. Monaghan Co., Inc.
Smith-Morris Corp.
Stainless Steel Products, Inc.

BERYLLIUM

Belmont Smelting & Refining Works, Inc.
Beryllium Corp., The
Bram Metallurgical & Chemical Co.
Brush Beryllium Co., The
Delta Chemical Works, Inc.
***DIVERSEY ENGRG. CO.**
***RESEARCH ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Terminal Radio Corp.

BRIDGES

Acton Laboratories Inc.
Alpha Instrument Co.
Barnes Development Co.
Boonton Radio Corp.
Dwyer Engrg. Co., Inc.
Electro-Measurements Inc.
General Electric Co., Apparatus Sales Div.
Haller Raymond & Brown Inc.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Marconi Instruments
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Impedance

Acton Laboratories Inc.
Alpha Instrument Co.
Barnes Development Co.
Boonton Radio Corp.
Electro-Measurements Inc.
Haller Raymond & Brown Inc.
Industrial Instruments Inc.
Leeds & Northrup Co.
Marconi Instruments
Narda Microwave Corp., The
Radex Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Inductance

Acton Laboratories Inc.
Alpha Instrument Co.
Barnes Development Co.
Crescent Engrg. & Research Co.
Electro-Measurements Inc.
Haller Raymond & Brown Inc.
Leeds & Northrup Co.
Marconi Instruments
Servomechanisms, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Megohm

Alpha Instrument Co.
Barnes Development Co.
James G. Biddle Co.
Electro-Measurements Inc.
Haller Raymond & Brown Inc.
Industrial Instruments Inc.
Keithley Instruments, Inc.
Leeds & Northrup Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Resistance

Allegheny Instrument Co., Inc.
Alpha Instrument Co.
Barnes Development Co.
James G. Biddle Co.
Electro-Measurements, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Haller Raymond & Brown, Inc.
Industrial Instruments, Inc.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Marconi Instruments
Minneapolis-Honeywell Regulator Co., Industrial Div.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
United Control Corp.

RF

Boonton Radio Corp.
Haller Raymond & Brown, Inc.
Marconi Instruments
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.

Self-Balancing

Barnes Development Co.
Dwyer Engrg. Co., Inc.
Haller Raymond & Brown, Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
North Atlantic Industries, Inc.
Simmonds Aerocessories, Inc.
Terminal Radio Corp.
United Control Corp.

Standing Wave

Demronay-Bonardi
Haller Raymond & Brown, Inc.
Terminal Radio Corp.

Synchro

Electro-Measurements, Inc.
Haller Raymond & Brown, Inc.
Kearfott Co., Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Ryan Aeronautical Co.
Terminal Radio Corp.
Theta Instrument Corp.
United Control Corp.

BRONZE

American Brake Shoe Co.
American Brass Co., The
American Non Gran Bronze Co.
American Silver Co.
Ampco Metal, Inc.
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Chase Brass & Copper Co., Inc.
A. Y. McDonald Mfg. Co.
Olin Mathieson Chemical Corp., High Energy Fuels Div.
True Alloys, Inc.
Springfield Brass Co.
Titan Metal Mfg. Co.

BRUSHES, MOTOR

Carbone Corp., The
Engelhard Industries Inc., D. E. Makepeace Div.
***GRAPHITE METALLIZING CORP.**
Helwig Co.
Keystone Carbon Co.
Morganite, Inc.
Ohio Carbon Co., The
Pure Carbon Co., Inc.
St. Marys Carbon Co.
Superior Carbon Products, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

BUSHINGS

Acme Industrial Co.
American Brass Co., The
Ampco Metal, Inc.
Amplex Div.-Chrysler Corp.
Bearium Metals Corp.
Bergen Carbide Co.
Century Fasteners Corp.
Corbin Products Div.
R. C. Dudek & Co.
Emerson Plastics Corp.
Federal Machine Co., Inc.
General Cable Corp.
***GRAPHITE METALLIZING CORP.**
Walter K. Jaros, Aircrafters
Kemp, Inc.
Walter Lee Chemical Corp.
J. A. Maurer, Inc.
Morganite, Inc.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
True Alloys Inc.
Randall Graphite Bearings, Inc.
Roberts Toledo Rubber Co., The
St. Marys Carbon Co.
Seamless Products Co., Inc.
Southwest Products Co.
Springfield Brass Co.
Superior Carbon Products, Inc.
Wrought Washer Mfg. Co.

CALLING SYSTEMS, SELECTIVE, NAVIGATION

Bell & Gossett Co.
Burroughs Corp.
Collins Radio Co.
Feiler Engrg. & Mfg. Co.
Motorola Inc., Military Marketing Div.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Varo Mfg. Co.

CAPACITOR SPECIALTIES MEASUREMENT

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Associated American Winding Co., Inc.
Barnes Development Co.
Boonton Electronics Corp.
Potter Co., The
Southern Electronics Corp.
Telectro Industries Corp.

CAPACITORS

Aerovox Corp.
Airborne Accessories Corp.
Associated American Winding Co., Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Corning Glass Works
Dearborn Electronic Laboratories
Electric Auto-Lite Co., The
Electron Products Inc.
Electronic Fabricators, Inc.
Erie Resistor Corp.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lapp Insulator Co., Inc., Radio Specialties Div.
Leeds & Northrup Co.
Minitronics Corp.
Mucon Corp.
Onondaga Pottery Co., Electronics Div.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
United Electronics Co.

Ceramic

Aerovox Corp.
American Lava Corp.
Associated American Winding Co., Inc.
Bendix Products Div., Bendix Aviation Corp.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Electra Mfg. Co.
Electric Auto-Lite Co., The
Erie Resistor Corp.
John E. Fast & Co.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gulton Industries, Inc.
P. R. Mallory & Co. Inc.
Mucon Corp.
Onondaga Pottery Co., Electronics Div.
Radio Industries, Inc.
Terminal Radio Corp.
Western Gold & Platinum

Ceramic Trimmer

Aerovox Corp.
American Lava Corp.
Corning Glass Works
Erie Resistor Corp.
General Instrument Corp., Defense Products Div.
Terminal Radio Corp.

Composition

Aerovox Corp.
General Instrument Corp., Defense Products Div.
P. R. Mallory & Co. Inc.
Potter Co., The
Telectro Industries Corp.
Terminal Radio Corp.
Texas Capacitor Co.

Decade

Aerovox Corp.
Balco Research Labs., Inc., Capacitor Div.
Barnes Development Co.
Electro-Measurements Inc.
Gudeman Co., The
Industrial Instruments Inc.
Leeds & Northrup Co.
Plastic Capacitors, Inc.
Potter Co., The
Southern Electronics Corp.
Terminal Radio Corp.
Texas Capacitor Co.

Electrolytic

Aerovox Corp.
Electro-Capacitors Co., Inc.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Kennametal Inc.
Magnavox Co., The
P. R. Mallory & Co. Inc.
Minitronics Corp.
Minneapolis-Honeywell Regulator Co., Boston Div.
Sangamo Electric Co.
Terminal Radio Corp.
Texas Capacitor Co.

Feed-Through

Aerovox Corp.
Airborne Accessories Corp.

Axel Electronics
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Dearborn Electronic Laboratories
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
Gudeman Co., The
Hallett Mfg. Co.
Potter Co., The
Radio Industries, Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Vitramon, Inc.

Fixed

Aerovox Corp.
Airborne Accessories Corp.
Associated American Winding Co., Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lapp Insulator Co., Inc., Radio Specialties Div.
P. R. Mallory & Co. Inc.
Mucon Corp.
Plastic Capacitors, Inc.
Potter Co., The
Radio Industries, Inc.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
United Electronics Co.
Vitramon, Inc.

Gas-Filled

Terminal Radio Corp.

Glass

Corning Glass Works
Plastic Capacitors, Inc.
Potter Co., The
Terminal Radio Corp.
Texas Capacitor Co.
Vitramon, Inc.

Hermetically Sealed

Aerovox Corp.
Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Corning Glass Works
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Fansteel Metallurgical Corp.
John E. Fast & Co.
Filtron Co., Inc.
Thomas T. Fox Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Minitronics Corp.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
Vitramon, Inc.

High Temperature

Aerovox Corp.
Airborne Accessories Corp.
Associated American Winding Co., Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Erie Resistor Corp.
Fansteel Metallurgical Corp.
John E. Fast & Co.
Filtron Co., Inc.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Mucon Corp.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Servomechanisms, Inc.
Southern Electronics Corp.
Terminal Radio Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
United Electronics Co.
Vitramon, Inc.

High Voltage

AMP Inc.
Aerovox Corp.
Airborne Accessories Corp.
Associated American Winding Co., Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Dearborn Electronic Laboratories
Electra Mfg. Co.
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
Gudeman Co., The
Hammett Electric Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Plastic Capacitors, Inc.
Potter Co., The
Radio Industries, Inc.
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
United Electronics Co.

Industrial

Aerovox Corp.
Airborne Accessories Corp.
Axel Electronics
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Dearborn Electronic Laboratories
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
Gudeman Co., The
P. R. Mallory & Co. Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Sarkes Tarzian, Inc.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Mica

Aerovox Corp.
Bram Metallurgical & Chemical Co.
Corning Glass Works
Erie Resistor Corp.
General Instrument Corp., Defense Products Div.
Leeds & Northrup Co.
Sangamo Electric Co.
Terminal Radio Corp.
Texas Capacitor Co.

Miniature

Aerovox Corp.
Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Corning Glass Works
Dearborn Electronic Laboratories
Electra Mfg. Co.
Electronic Fabricators, Inc.
Erie Resistor Corp.
Fansteel Metallurgical Corp.
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
E. F. Johnson Co.
P. R. Mallory & Co. Inc.
McCoy Electronics Co.
Mucon Corp.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Servomechanisms, Inc.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Vitramon, Inc.

Modulated Sweep

Terminal Radio Corp.
Wacline, Inc.

Mylar Dielectric

Aerovox Corp.
Airborne Accessories Corp.
Allied Plastics Supply Corp.
Associated American Winding Co., Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
John E. Fast & Co.
Filtron Co., Inc.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lenkurt Electric Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
Westlake Plastics, CrystalX Corp.

Neutralizing

General Instrument Corp., Defense Products Div.
E. F. Johnson Co.
Mucon Corp.
Tobe Deutschmann Corp.

Oil

Aerovox Corp.
Axel Electronics
Dearborn Electronic Laboratories
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lenkurt Electric Co., Inc.
P. R. Mallory & Co., Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Plastic Capacitors, Inc.
Sangamo Electric Co.
Texas Capacitor Co.
Tobe Deutschmann Corp.

Paper

Aerovox Corp.
Associated American Winding Co., Inc.
Axel Electronics
Dearborn Electronic Laboratories
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lenkurt Electric Co., Inc.
P. R. Mallory & Co. Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Peter J. Schweitzer, Inc.
Texas Capacitor Co.
Tobe Deutschmann Corp.

Piston

General Instrument Corp., Defense Products Div.

Plastic

Aerovox Corp.
Allied Plastics Supply Corp.
Aristocrat Plastics, Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Dearborn Electronic Laboratories
Electric Auto-Lite Co., The
John E. Fast & Co.
Filtron Co., Inc.
Franklin Fibre-Lamitex Corp.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
Westlake Plastics, CrystalX Corp.

Plastic Dielectric

Aerovox Corp.
Allied Plastics Supply Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Dearborn Electronic Laboratories
Electro-Measurements Inc.
Electronic Fabricators, Inc.
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
Franklin Fibre-Lamitex Corp.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lenkurt Electric Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
Westlake Plastics, CrystalX Corp.

Plug-In

Aerovox Corp.
Balco Research Labs., Inc., Capacitor Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg Co.

Gudeman Co., The
Plastic Capacitors, Inc.
Radio Industries, Inc.
Sangamo Electric Co.
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.

Polystryene Insulated

Aerovox Corp.
Airborne Accessories Corp.
Allied Plastic Supply Corp.
Balco Research Labs. Inc., Capacitor Div.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
John E. Fast & Co.
Filtron Co., Inc.
Franklin Fibre-Lamitex Corp.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lenkurt Electric Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
Westlake Plastics, CrystalX Corp.

Porcelain

Aerovox Corp.
American Lava Corp.
General Instrument Corp., Defense Products Div.
Plastic Capacitors, Inc.
Potter Co., The
Vitramon, Inc.

Precision

Aerovox Corp.
Airborne Accessories Corp.
Associated American Winding Co., Inc.
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub-Telecomputing Corp.
Dearborn Electronic Laboratories
Electro-Measurements Inc.
Electronic Fabricators, Inc.
Erie Resistor Corp.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Leeds & Northrup Co.
Lenkurt Electric Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
United Electronics Co.

Pressure Types

General Instrument Corp., Defense Products Div.
Southern Electronics Corp.

Printed Circuit

Aerovox Corp.
Allied Plastics Supply Corp.
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub-Telecomputing Corp.
Electra Mfg. Co.
Erie Resistor Corp.
John E. Fast & Co.
General Cement Mfg. Co., Div.-Textron Inc.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
P. R. Mallory & Co. Inc.
Plastic Capacitors, Inc.
Potter Co. The
Radio Industries, Inc.
Sangamo Electric Co.
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.
Vitramon, Inc.

Receiver Tuning

Associated American Winding Co., Inc.
General Instrument Corp., Defense Products Div.
McCoy Electronics Co.
Sarkes Tarzian, Inc.
Texas Capacitor Co.

Silicone-Filled

Aerovox Corp.
Allied Plastics Supply Corp.
Axel Electronics
Brubaker Electronics, Inc., Sub-Telecomputing Corp.
Dearborn Electronic Laboratories
Filtron Co., Inc.
General Instrument Corp., Defense Products Div.
Gudeman Co., The
Minneapolis-Honeywell Regulator Co., Boston Div.
Potter Co., The
Sangamo Electric Co.
Tobe Deutschmann Corp.

Silvered Mica

Aerovox Corp.
Balco Research Labs., Inc., Capacitor Div.
Erie Resistor Corp.
Filmohm Corp.
General Instrument Corp., Defense Products Div.
Leeds & Northrup Co.
Sangamo Electric Co.

Standard

Aerovox Corp.
Airborne Accessories Corp.
Boonton Electronics Corp.
Brubaker Electronics, Inc., Sub-Telecomputing Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Leeds & Northrup Co.
Sangamo Electric Co.
Southern Electronics Corp.
Telectro Industries Corp.

Tantalum

Aerovox Corp.
Bram Metallurgical & Chemical Co.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Gudeman Co., The
Kennametal Inc.
P. R. Mallory & Co. Inc.
Minitronics Corp.
***SCHWEBER ELECTRONICS**

Teflon, Dielectric

Aerovox Corp.
Airborne Accessories Corp.
Allied Plastics Supply Corp.
Associated American Winding Co., Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Dearborn Electronic Laboratories
Duroyd Gasket Mfg. Co.
Electronic Fabricators, Inc.
Filtron Co., Inc.
General Instrument Corp., Defense Products Div.
Good-All Electric Mfg. Co.
Plastic Capacitors, Inc.
Potter Co., The
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.

Temperature Compensated

Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics Inc., Sub-Telecomputing Corp.
Dearborn Electronic Laboratories
Electra Mfg. Co.
Erie Resistor Corp.
General Instrument Corp., Defense Products Div.
Mucon Corp.
Onondaga Pottery Co., Electronics Div.
Plastic Capacitors, Inc.
Potter Co., The
Radio Industries, Inc.
Southern Electronics Corp.
Texas Capacitor Co.
Tobe Deutschmann Corp.

Transmitter Tuning

Associated American Winding Co., Inc.
General Instrument Corp., Defense Products Div.
E. F. Johnson Co.
United Electronics Co.
Vacap Corp.

Transmitting

Aerovox Corp.
Associated American Winding Co., Inc.
Corning Glass Works
Dolinko & Wilkens, Inc.
John E. Fast & Co.
General Instrument Corp., Defense Products Div.
Sangamo Electric Co.
United Electronics Co.
Vacap Corp.

Vacuum Types

Aerovox Corp.
Dolinko & Wilkens, Inc.
General Instrument Corp., Defense Products Div.
John Gombos Co., Inc.
United Electronics Co.
Vacap Corp.

Variable

Associated American Winding Co., Inc.
Balco Research Labs., Inc., Capacitor Div.
Don-Lan Electronics Co.
Erie Resistor Corp.
General Instrument Corp., Defense Products Div.
John Gombos Co., Inc.
Hughes Products, Hughes Aircraft Co., Semiconductor Div.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
McCoy Electronics Co.
Potter Co., The
Sarkes Tarzian, Inc.
Southern Electronics Corp.
Telectro Industries Corp.
United Electronics Co.
Vacap Corp.

CARTRIDGES, CRYSTAL

Magnavox Co., The
Shure Brothers, Inc.
Telectro Industries Corp.

CASINGS

ACF Industries, Inc., Advanced Products Div.
Continental Diamond Fibre Corp., Sub— The Budd Co.
Pacific Alloy Engrg. Corp.
Ryan Aeronautical Co.

CHROMATOGRAPHS

Consolidated Electrodynamics Corp.
Leeds & Northrup Co.
Southwestern Industrial Electronics Co.

CHRONOGRAPHS

Electro-Medical Lab., Inc.
Hamilton Watch Co., Military Products Div.
Optomechanisms Inc.
Science House, Inc.
Technical Oil Tool Corp.
Wakmann Watch Co., Inc.

CHRONOMETERS

Consolidated Avionics Corp.
Elgin National Watch Co.
Hamilton Watch Co., Military Products Div.
Technical Oil Tool Corp.
Wakmann Watch Co. Inc.

CHRONOSCOPES

Hamilton Watch Co., Military Products Div.
Optomechanisms Inc.
Telectro Industries Corp.

CIRCUITS, COMPUTER LOGIC

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Autonetics, Div.-North American Aviation, Inc.
Bendix Aviation Corp., York Div.
Burroughs Corp.
Chicago Div. American Bosch Arma Corp.
Computer Control Co., Inc.
Dale Products, Inc.
Dunlap Electronics Inc.
Eaton Electronics Corp.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Ferranti Electric Inc.
General Precision Lab., Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
Librascope Inc.
Precision Circuits, Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Techniques, Inc.
Telectro Industries Corp.
Tingstol Co.
Walkirt Co.

CIRCUITS, PLATED

Advance Industries, Inc.
Arthur Ansley Mfg. Co.
Burroughs Corp.
Dale Products, Inc.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eaton Electronics Corp.
Electronic Techniques, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Precision Lab. Inc.
Haller Raymond & Brown Inc.
Hammett Electric Co.
La Pointe Industries Inc.
Librascope Inc.
Litton Industries, Components Div.
Mycalex Corp. of America
Precision Circuits, Inc.
Printed Electronics Corp.
Skiatron Electronics & Television Corp.
Star Engraving Co., Ltd.
Techniques, Inc.
Tingstol Co.

CIRCUITS, PLUG-IN

Advance Industries, Inc.
Alden Products Co.
Arthur Ansley Mfg. Co.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.

Bendix Aviation Corp., York Div.
Burroughs Corp.
Cleveland Metal Specialties Co.
Dale Products, Inc.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eaton Electronics Corp.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Electronic Techniques, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ferranti Electric Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Hammett Electric Co.
Industrial Control Co.
International Electric Industries, Inc.
Kilgen Aircraft Div.-The Kilgen Organ Co.
La Pointe Industries Inc.
Librascope Inc.
Litton Industries, Components Div.
Lytle Engrg. & Mfg. Co.
NYT Electronics, Inc.
Onondaga Pottery Co., Electronics Div.
Precision Circuits, Inc.
Printed Electronics Corp.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Star Engraving Co., Ltd.
Stromberg-Carlson, Electronics Div.
Sylvania Electronics Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Tingstol Co.
Topper Mfg. Co., Inc.
Walkirt Co.

CIRCUITS-PRINTED, STAMPED, ETCHED

Advance Industries, Inc.
Aerovox Corp.
Allied Plastics Supply Corp.
Arthur Ansley Mfg. Co.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Burroughs Corp.
Cleveland Metal Specialties Co.
Consolidated Electrodynamics Corp.
Corning Glass Works
Dale Products, Inc.
Dunlap Electronics, Inc.
Dwyer Engr. Co., Inc.
Eaton Electronics Corp.
Electra-Lab Inc.
Electronic Associates, Inc.
Electronic Techniques, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Elektro-Serv Co.
Erie Resistor Corp.
Etched Products Corp.
General Components Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Hammett Electric Co.
Hansen Electronics Co.
Hoover Electronics Co.
La Pointe Industries Inc.
Librascope Inc.
Litton Industries, Components Div.
Lytle Engrg. & Mfg. Co.
Mica Corp.
Milmanco
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Mycalex Corp. of America
Naz-Dar Co.
Photocircuits Corp.
Precision Circuits, Inc.
Printed Electronics Corp.
Rogers Corp.
Ryan Aeronautical Co.
St. Regis Paper Co.
Sanders Associates, Inc.
Skiatron Electronics & Television Corp.
Star Engraving Co., Ltd.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Techron Corp.
Techniques, Inc.
Telectro Industries Corp.
Tingstol Co.
Topper Mfg. Co., Inc.
Zenith Optical Laboratory

CLINOMETERS

Optomechanisms Inc.
Telectro Industries Corp.

CLIPS, ALLIGATOR

Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Birnbach Radio Co., Inc.
Federal Screw Products Inc.
General Cement Mfg. Co., Div.-Textron Inc.
Mueller Electric Co.

CLIPS, CRYSTAL DIODE

Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Atlas E-E Corp.
Augat Brothers, Inc.
Hobson Brothers, Inc.
Keystone Electronics Corp.

COATINGS, PRINTED CIRCUIT

Avondale Co., The
Bradford Components, Inc.
Dwyer Engrg. Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Cement Mfg. Co., Div.-Textron Inc.
B. F. Goodrich Industrial Products Co.
***IDEAL CHEMICAL PRODUCTS, INC.**
Krylon, Inc.
Narmco Resins & Coatings Co.
Ryan Aeronautical Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Zenith Optical Laboratory

COIL ASSEMBLIES

A. P. W. Co.
Ace Coil & Electronics Co.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
American Research & Mfg. Corp.
Atlas Resistor Co.
Bendix Aviation Corp., York Div.
Caddell-Burns Mfg. Co. Inc.
Celco-Constantine Engrg. Laboratories Co.
Dittmore-Freimuth Corp.
First Electronics Corp., The
Franklin Fibre-Lamitex Corp.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Gray & Kuhn Inc.
Lenkurt Electric Co., Inc.
Lumen, Inc.
Mar Vista Engrg. Co.
National Coil Co.
Philco Corp., Government & Industrial Divs.
Precision, Inc.
Ram Electronics Inc.
Rowe Industries
Sealectric Switch & Relay Corp.
Standard Electromagnetics, Inc.
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Tresco, Inc.
Triad Transformer Corp.
Tri-dex Co.
Tucson Instrument Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Winatic Corp., The
Wright Zimmerman, Inc.

COILS

A. P. W. Co.
Ace Coil & Electronics Co.
Advance Industries, Inc.
Aerolite Electronics Corp.
Aladdin Electronics, Div.-Aladdin Industries, Inc.
American Research & Mfg. Corp.
Associated American Winding Co., Inc.
Caddell-Burns Mfg. Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Electric Auto-Lite Co., The
Electro Engrg. Works
Electronic Transformer Co., Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Gray & Kuhn Inc.
Highland Engrg. Co.
Johnson Electronics Inc.
***KAHN & CO., INC.**
Lumen, Inc.
Mara Electronics, Inc.
J. W. Miller Co.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Philco Corp., Government & Industrial Divs.
Ram Electronics Inc.
Servomechanisms, Inc.
Sioux Radio Products
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wright Zimmerman, Inc.

A-F Choke

Aerolite Electronics Corp.
Associated American Winding Co., Inc.
Burnell & Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
De Coursey Engrg. Lab.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Ferranti Electric Inc.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Highland Engrg. Co.
Johnson Electronics Inc.
Mara Electronics, Inc.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Ram Electronics Inc.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Sterling Transformer Corp.
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Telectro Industries Corp.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.

Choke

A. P. W. Co.
Aerolite Electronics Corp.
Aladdin Electronics, Div.-Aladdin Industries Inc.
American Research & Mfg. Corp.
Associated American Winding Co., Inc.
Bradford Components, Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Cycle Transformer Corp.
De Coursey Engrg. Lab.
Electrical Windings, Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Ferranti Electric Inc.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Gray & Kuhn Inc.
Highland Engrg. Co.
Hindle Transformer Co. Inc.
Johnson Electronics Inc.
J. W. Miller Co.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Ram Electronics Inc.
Sioux Radio Products
Standard Electronics Div., Radio Engrg. Labs. Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Telectro Industries Corp.
Transonic, Inc.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wilmar Mfg. Co., Inc.

Booster

Aerolite Electronics Corp.
Associated American Winding Co., Inc.
Central Transformer Co.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Johnson Electronics Inc.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.

Filter Choke

Aerolite Electronics Corp.
American Research & Mfg. Corp.
Associated American Winding Co., Inc.
Bendix Aviation Corp., York Div.
Bradford Components, Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Cycle Transformer Corp.

De Coursey Engrg. Lab.
Electrical Windings, Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Ferranti Electric Inc.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Highland Engrg. Co.
Hindle Transformer Co. Inc.
Johnson Electronics Inc
Lenkurt Electric Co., Inc.
Mara Electronics In
J. W. Miller Co.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
Ortho Filter Corp.
RS Electronics Corp.
Ram Electronics Inc
Sioux Radio Products
Standard Electronics Div., Radio Engrg. Labs. Inc.
Sterling Transformer Corp.
Tele-Coil Co.
Telectro Industries Corp.
Transonic, Inc.
Tresco, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wilmar Mfg. Co., Inc.

I-F

Ace Coil & Electronics Co.
Aerolite Electronics Corp.
Aladdin Electronics, Div.-Aladdin Industries Inc.
Associated American Winding Co., Inc.
Bendix Aviation Corp., York Div.
Bradford Components, Inc.
Burnell & Co., Inc.
Caddell-Burns Mfg. Co. Inc.
Carad Corp.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Gray & Kuhn Inc.
Johnson Electronics Inc.
J. W. Miller Co.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Philco Corp., Government & Industrial Divs.
Ram Electronics Inc.
Redman Electronics Corp.
Sioux Radio Products
Superex Electronics Corp.
Sylvania Electronics Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Telectro Industries Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.
Wright Zimmerman, Inc.

Printed Circuit

Ace Coil & Electronics Co.
Associated American Winding Co., Inc.
Bendix Aviation Corp., York Div.
Celco-Constantine Engrg. Laboratories Co.
Cleveland Metal Specialties Co.
Eaton Electronics Corp.
Electronic Associates, Inc.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Johnson Electronics Inc.
Methode Mfg. Corp.
Mica Corp.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co. Inc.
Onondaga Pottery Co., Electronics Div.
RS Electronics Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Sioux Radio Products
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Techniques, Inc.
Telectro Industries Corp.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.

R-F Choke

Ace Coil & Electronics Co.
Aerolite Electronics Corp.
Aladdin Electronics, Div.-Aladdin Industries Inc.
Associated American Winding Co., Inc.
Bradford Components, Inc.
Caddell-Burns Mfg. Co. Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Corning Glass Works
Fugle-Miller Labs. Inc.
General Instrument Corp., Defense Products Div.
Gray & Kuhn Inc.
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics Inc.
J. W. Miller Co.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Redman Electronics Corp.
Sioux Radio Products
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.
Wilmar Mfg. Co., Inc.
Wright Zimmerman, Inc.

R-F Transmitting

Ace Coil & Electronics Co.
Aerolite Electronics Corp.
Associated American Winding Co., Inc.
Caddell-Burns Mfg. Co. Inc.
Carad Corp.
Fugle-Miller Labs. Inc.
General Instrument Corp., Defense Products Div.
Illumitronic Engrg. Co.
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics Inc.
J. W. Miller Co.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
North Hills Electric Co., Inc.
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Telectro Industries Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.
Wilmar Mfg. Co., Inc.
Winatic Corp., The
Wright Zimmerman, Inc.

Solenoid

A. P. W. Co.
Ace Coil & Electronics Co.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
Associated American Winding Co., Inc.
Automatic Electric Sales Corp.
Caddell-Burns Mfg. Co. Inc.
Celco-Constantine Engrg. Laboratories Co.
Cycle Transformer Corp.
Electrical Windings, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fugle-Miller Labs. Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Highland Engrg. Co.
Walter J. Hyatt Co., The
Johnson Electronics Inc.
***KAHN & CO., INC.**
***KOONTZ-WAGNER ELECTRIC CO., INC.**
Mar Vista Engrg. Co.
Mara Electronics, Inc.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Precision, Inc.
Ram Electronics Inc.
Sealectric Switch & Relay Corp.
Standard Electromagnetics, Inc.
Tele-Coil Co.
Telectro Industries Corp.
Tri-Dex Co.
Tur-Bo Jet Products Co., Inc.
***UNITED AIRCRAFT PRODUCTS, INC.**
Varo Mfg. Co.
Warren Transformer Co., Inc.
Western Coil Products Co.

Transducer

American Research & Mfg. Corp.
Associated American Winding Co., Inc.
Columbia Research Labs.
Crescent Engrg. & Research Co.
Fugle-Miller Labs. Inc.
General Instrument Corp., Defense Products Div.
Johnson Electronics Inc.
National Coil Co.
Telectro Industries Corp.
Tri-Dex Co.
Tur-Bo Products Co., Inc.
Varo Mfg. Co.
Warren Transformer Co., Inc.

Variable

Ace Coil & Electronics Co.
Aerolite Electronics Corp.
Airflyte Electronics Co.
Associated American Winding Co., Inc.
Burnell & Co., Inc.
Caddell-Burns Mfg. Co. Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Fugle-Miller Labs. Inc.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Gray & Kuhn Inc.
E. F. Johnson Co.
Johnson Electronics Inc.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ram Electronics Inc.
Superex Electronics Corp.
Tele-Coil Co.
Telectro Industries Corp.
United Transformer Corp.
Vari-L Co., Inc.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Western Coil Products Co.

COLLECTOR RINGS

Amplex Div.-Chrysler Corp.
Electro Tec Corp.
Electro Tec Corp., Virginia Div.
Electro-Miniatures Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Gibson Electric Co.
***GRAPHITE METALLIZING CORP.**
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Penn-Michigan Mfg. Corp.
Poly-Scientific Corp.
Sangamo Electric Co.
***SLIP RING CO. OF AMERICA**
Stainless Steel Products, Inc.
Superior Carbon Products, Inc.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Tricon Mfg. Co.

COMMUNICATIONS SYSTEMS

Applied Research Inc.
Bell & Gossett Co.
Brush Instruments, Div.-Clevite Corp.
Communications Co.
***DATA-CONTROL SYSTEMS INC.**
Elm Mfg. Co. Inc.
Executone, Inc.
Feiler Engrg. & Mfg. Co.
General Instrument Corp., Defense Products Div.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hammett Electric Co.
Hogan Laboratories, Inc.
Hycon Eastern Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
International Research Associates
Lenkurt Electric Co., Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
National Electronics Laboratories, Inc.
Resdel Engrg. Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Telechrome Mfg. Corp.
***TELE-DYNAMICS INC.**
Thompson Products, Inc.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wickes Engrg. & Construction Co. Inc.
Wilcox Electric Co., Inc.
Wunderlich Radio Co.

COMPARATORS

American Electronics, Inc., Data-Tronics Div.
Baird-Atomic, Inc.
Barnes Development Co.
Brush Instruments, Div.-Clevite Corp.
Cleveland Instrument Co.
Eastman Kodak Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Optomechanisms Inc.
Perkin-Elmer Corp.
Sanders Associates, Inc.
Size Control Co.
Stromberg-Carlson, Electronics Div.
Transformers, Inc.
Varo Mfg. Co.

COMPASSES

Kearfott Co., Inc.
Lear Inc.
Librascope Inc.

Electronic Gyro

Eclipse-Pioneer Div., Bendix Aviation Corp.
General Electric Co., Apparatus Sales Div.

General Precision Lab. Inc.
Kearfott Co., Inc.
La Pointe Industries Inc.
Lear Industries Inc.
Lear, Inc.
Ryan Aeronautical Co.

Gyro

Autonetics, Div.-North American Aviation, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
General Electric Co., Apparatus Sales Div.
General Precision Lab. Inc.
Kearfott Co., Inc.
La Pointe Industries Inc.

Magnetic

General Electric Co., Instrument Dept.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Lear, Inc.
Perkin-Elmer Corp.
U. S. Gauge, Div.-American Machine & Metals, Inc.

Radio

General Instrument Corp., Defense Products Div.
Kearfott Co., Inc.
Lane Electronics Mfg. Corp.
Lear, Inc.
Magnavox Co., The
Wunderlich Radio Co.

Remote Indicating

Eclipse-Pioneer Div., Bendix Aviation Corp.
Kearfott Co., Inc.
Lear, Inc.
Ryan Aeronautical Co.
Telectro Industries Corp.
Wunderlich Radio Co.

COMPUTERS

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Advance Industries, Inc.
Allegany Instrument Co., Inc.
Allied Plastics Supply Corp.
American Electronics, Inc.
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
***AVCO MFG. CORP., CROSLEY DIV.**
Benson-Lehner Corp.
Burroughs Corp.
CDC Control Services, Inc.
Collins Radio Co.
Consolidated Avionics Corp.
Electro-Measurements Inc.
Electronic Associates, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Ferranti Electric Inc.
George F. Forbes, Industrial Mathematician Publisher
Ford Instrument Co., Inc.
GPS Instrument Co., Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Precision Lab. Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Kearfott Co. Inc.
Lear, Inc.
Librascope Inc.
Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Nuclear Products—Erco, Div.-ACF Industries, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Technical Oil Tool Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Analog

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Advance Industries, Inc.
Allegany Instrument Co., Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
***AVCO MFG. CORP., CROSLEY DIV.**
Baird-Atomic, Inc.
Bendix Computer, Div.-Bendix Aviation Corp.
Bowmar Instrument Corp.
CDC Control Services, Inc.
Cal-Ohm Labs., Inc.
Chadwick-Helmuth Co.
Collins Radio Co.
***DATA-CONTROL SYSTEMS INC.**
Daystrom Instrument Div., Daystrom, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Feedback Controls, Inc.
George F. Forbes, Industrial Mathematician, Publisher
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Controls Co.
General Electric Co., Apparatus Sales Div.
General Precision Lab, Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Industrial Control Co.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub-Standard Coil Products Co. Inc.
Lear, Inc., Grand Rapids Div.
Librascope Inc.
Link Aviation, Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Nuclear Products—Erco., Div.-ACF Industries, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
George A. Philbrick Researches, Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
Walkirt Co.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Course Line

Advance Industries, nlc.
Autonetics, Div.-North American Aviation, Inc.
Collins Radio Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Engrg. Co. of California
General Precision Lab. Inc.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Lear, Inc.
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Science House, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Digital

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Advance Industries, Inc.
Allied Plastics Supply Corp.
Alwac Corp.
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Arma Div.-American Bosch Arma Corp.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Bendix Aviation Corp., York Div.
Bendix Computer, Div.-Bendix Aviation Corp.
Benson-Lehner Corp.
Burroughs Corp.
CDC Control Services, Inc.
Collins Radio Co.
Computer Control Co., Inc.
Consolidated Avionics Corp.
Cubic Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electrodata Div.-Burroughs Corp.
Electronic Engrg. Co. of California
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ferranti Electric, Inc.
George F. Forbes, Industrial Mathematician, Publisher
General Precision Lab., Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown, Inc.
Hoffman Electronics Corp., Semiconductor Div.
Kearfott Co., Inc.
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Milman Engrg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products, Inc.
Telectro Industries Corp.
Thompson Products, Inc.
Wayne-George Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Navigation

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Advance Industries, Inc.
Allied Plastics Supply Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Bowmar Instrument Corp.
Burroughs Corp.
Collins Radio Co.
Dynavia Engrg. Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electromation Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
George F. Forbes, Industrial Mathematician, Publisher
Ford Instrument Co., Div.-Sperry Rand Corp.
General Electric Co., Apparatus Sales Div.
General Precision Lab., Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown, Inc.
Kearfott Co., Inc.
Kinevox-Hallen
Kollsman Instrument Corp., Sub.-Standard Coil Products Co., Inc.
Lear, Inc.
Librascope, Inc.
Link Aviation, Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
M. Ten Bosch, Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Offset Track

Advance Industries, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Precision Lab., Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown, Inc.
Lear, Inc.
Librascope, Inc.
Mechanical Div.-General Mills, Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.

Storage, Electrostatic

Haller Raymond & Brown, Inc.
Librascope, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Storage, Ferroelectric

Burroughs Corp.
Librascope, Inc.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.

Storage, Magnetic

Alden Products Co.
Alwac Corp.
Autonetics, Div.-North American Aviation, Inc.
Bryant Gage & Spindle Div., Bryant Chucking Grinder Co.
Burroughs Corp.
Daystrom Instrument Div., Daystrom, Inc.
Epsco, Inc.
Ferranti Electric, Inc.
General Ceramics Corp.
General Railway Signal Co.
General Transistor Western Corp.
Haller Raymond & Brown, Inc.
Librascope, Inc.
Miljan Div., Paul Omohundro Co.
Philco Corp., Government & Industrial Divs.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Stromberg-Carlson, Electronics Div.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

CONNECTORS

Alden Products Co.
American Brass Co., The
Anton Electronics Labs., Inc.
Burndy Corp., Omaton Div.
Cannon Electric Co.
Circon Component Corp.
Continental Connector Corp.
Dage Electric Co., Inc.
Dejur-Amsco Corp.
R. C. Dudek & Co.
Elco Corp.
Enflo Corp.
Garde Mfg. Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General R-F Fittings, Inc.
Joclin Mfg. Co.
E. F. Johnson Co.
Litton Industries, Components Div.
***HAROLD H. POWELL CO.**
Scintilla Div., Bendix Aviation Corp.
Sylvania Electric Prdoucts Inc., Parts Div.
Telectro Industries Corp.
United Supply Co.
Western International Co.

Electric Subminiature

Airwork Corp.
Anton Electronic Labs., Inc.
Automatic & Precision Mfg. Co.
Avnet Corp.
Cannon Electric Co.
Circon Component Corp.
Coaxial Connector Co. Inc.
Columbia Research Labs.
Connector Corp.
Continental Connector Corp.
Dage Electric Co., Inc.
Dejur-Amsco Corp.
R. C. Dudek & Co.
Elco Corp.
Garde Mfg. Co.
General R-F Fittings, Inc.
Joclin Mfg. Co.
Litton Industries, Components Div.
Mendelsohn Speedgun Co., Inc.
Methode Mfg. Corp.
Molding Corp. of America
***HAROLD H. POWELL CO.**
***SCHWEBER ELECTRONICS**
Scintilla Div., Bendix Aviation Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Titeflex, Inc.
U. S. Component Inc.
United Supply Co.
Western International Co.
E. B. Wiggins Oil Tool Co. Inc.
Winchester Electronics, Inc.

Miniature

Aerolite Electronics Corp.
Airwork Corp.
Alden Products Co.
Anton Electronics Labs., Inc.
Avnet Corp.
Burndy Corp., Omaton Div.
Cannon Electric Co.
Circon Component Corp.
Coaxial Connector Co. Inc.
Connector Corp.
Consolidated Electrodynamics Corp.
Continental Connector Corp.
Dage Electric Co., Inc.
Dejur-Amsco Corp.
R. C. Dudek & Co.
Elco Corp.
Electronic Techniques, Inc.
Enflo Corp.
Garde Mfg. Co.
General R-F Fittings, Inc.
Joclin Mfg. Co.
Litton Industries, Components Div.
Malco Tool & Mfg. Co.
Mendelsohn Speedgun Co., Inc.
Methode Mfg. Corp.
Molding Corp. of America
Frank W. Morse Co.
***HAROLD H. POWELL CO.**
Richards Electrocraft, Inc.
***SCHWEBER ELECTRONICS**
Scintilla Div., Bendix Aviation Corp.
Sylvania Electric Products Inc., Parts Div.
Telectro Industries Corp.
Titeflex, Inc.
U. S. Component Inc.
Western International Co.
Winchester Electronics, Inc.

Pressurized

Airwork Corp.
Anton Electronic Labs., Inc.
Avnet Corp.
Burndy Corp., Omaton Div.
Cannon Electric Co.
Coaxial Connector Co. Inc.
Continental Connector Corp.
Dage Electric Co., Inc.
Dejur-Amsco Corp.
R. C. Dudek & Co.
Garde Mfg. Co.
General R-F Fittings, Inc.
Joclin Mfg. Co.
Joy Mfg. Co.
Mendelsohn Speedgun Co., Inc.
Molding Corp. of America
***HAROLD H. POWELL CO.**
***SCHWEBER ELECTRONICS**
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.
U. S. Component Inc.
Vibra Seal Corp.
Western International Co.
Winchester Electronics, Inc.

Printed Circuit

Allied Plastics Supply Corp.
Anton Electronic Labs., Inc.
Avnet Corp.
Cannon Electric Co.
Circon Component Corp.
Cleveland Metal Specialties Co.
Continental Connector Corp.
Dage Electric Co., Inc.
Dale Products, Inc.
Dejur-Amsco Corp.
R. C. Dudek & Co.
Dunlap Electronics, Inc.
Elco Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Franklin Fibre-Lamitex Corp.
Garde Mfg. Co.
General R-F Fittings, Inc.
La Pointe Industries Inc.
Malco Tool & Mfg. Co.
Methode Mfg. Corp.
National Tel-Tronics Corp.
***HAROLD H. POWELL CO.**
Naz-Dar Co.
***SCHWEBER ELECTRONICS**
Star Engraving Co., Ltd.
Sylvania Electric Products Inc., Parts Div.
Telectro Industries Corp.
Tingstol Co.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
U. S. Component Inc.
Winchester Electronics, Inc.

Rack and Panel

Aircom Inc.
Airwork Corp.
Alden Products Co.
Anton Electronic Labs., Inc.
Avnet Corp.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Cannon Electric Co.
Continental Connector Corp.
Dage Electric Co., Inc.
Dejur-Amsco Corp.
Don-Lan Electronics Co.
R. C. Dudek & Co.
Elco Corp
Garde Mfg. Co.
General Cement Mfg. Co., Div.-Textron Inc.
General R-F Fittings, Inc.
Heldor Mfg. Co., Inc.
Methode Mfg. Corp.
***HAROLD H. POWELL CO.**
Scintilla Div., Bendix Aviation Corp.
Telectro Industries Corp.
U. S. Component Inc.
Western International Co.
Winchester Electronics, Inc.

R-F

Aircom Inc.
Airtron, Inc.
Airwork Corp.
Anton Electronic Labs., Inc.
Blonder-Tongue Labs., Inc.
Burndy Corp., Omaton Div.
Cannon Electric Co.
Circon Component Corp.
Coaxial Connector Co. Inc.
Connector Corp. of America
Continental Connector Corp.
Garde Mfg. Co.
General R-F Fittings, Inc.
Hallett Mfg. Co.
J-V-M Microwave Co.
Mendelsohn Speedgun Co., Inc.
***HAROLD H. POWELL CO.**
Prodelin Inc.
***SCHWEBER ELECTRONICS**
Telectro Industries Corp.
Transco Products, Inc.
Western International Co.
Winchester Electronics, Inc.

Contactors

(Generator, load, transfer)
***HARTMAN ELECTRICAL MFG. CO., THE**

CONTROLS

Advance Industries, Inc.
Advanced Products Co., The
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
American Research & Mfg. Corp.
Barton Instrument Corp.
Bendix Aviation Corp., Red Bank Div.
Burroughs Corp.
CDC Control Services, Inc.
Cutler-Hammer Inc.
Daven Co., The
Dynavia Engrg. Corp.
***EASTERN INDUSTRIES, INC.**
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Exact Engrg. & Mfg. Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Railway Signal Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Lear, Inc.
Librascope Inc
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Automatic Approach

Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Barton Instrument Corp.
Bowmar Instrument Corp.
CDC Control Services, Inc.
Dynavia Engrg. Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Reeves Instrument Corp.
Robot Appliances Inc.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.

Capacitance Operated

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Machine Safety

Devco Engrg. Inc.
Dunlap Electronics, Inc.
Electric Eye Equipment Co.
General Scientific Equipment Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO**
Reid Metal Products, Inc.
Telectro Industries Corp.
Walsh Press & Die Co.

Motors & Generators

American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer Inc.
D & R, Ltd.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Fairfield Engineering Corp.
***GARRETT CORP., THE, AIRSEARCH MFG. DIVS.**
Globe Industries, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
***HARTMAN ELECTRICAL MFG. CO., THE**
Hertner Electric Co., The
Industrial Control Co.
Leach Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Motordyne Inc.
Sangamo Electric Co.
Servomechanisms, Inc.
Servomechanisms, Inc., Mechatrol Div.
Skiatron Electronics & Television Corp.
Talley Corp., The
Telectro Industries Corp.
Varo Mfg. Co.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Radio Remote

Bowmar Instrument Corp.
Communications Co.
Frank R. Cook Co.
***COOPER DEVELOPMENT CORP.**
***DATA-CONTROL SYSTEMS INC.**
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.

Hallamore Electronics Co.
Lane Electronics Mfg. Corp.
Magnavox Co., The
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Motorola Inc., Military Marketing Div.
Reeves Instrument Corp.
Robot Appliances Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Varo Mfg. Co.

Push-Pull

All American Aircraft Products, Inc.
Automotive & Aircraft Div.-American Chain & Cable Co., Inc.
Blaco Mfg. Co.
Consolidated Controls Corp.
Cutler-Hammer Inc.
Fairfield Engineering Corp.
Imperial Brass Mfg. Co., The
Lumen, Inc.
P. R. Mallory & Co. Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Robot Appliances Inc.
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Southwest Products Co.
Telectro Industries Corp.
Teleflex Inc.
Trimount Instrument Co.
Varo Mfg. Co.
Western Arc Welding, Inc.

Register

Analogue Controls, Inc.
Bowmar Instrument Corp.
Electric Eye Equipment Co.
Intercontinental Dynamics Corp.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Remote, Antenna

All American Aircraft Products, Inc.
Antlab Inc.
*DALMO VICTOR CO., DIV-TEXTRON INC.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Gabriel Co., The, Gabriel Electronics Div.
Globe Industries, Inc.
Goodyear Aircraft Corp.
Lear, Inc., Grand Rapids Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Motorola Inc., Military Marketing Div.
Reeves Instrument Corp.
Robot Appliances Inc.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Servo

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Aeroflex Corp., The, Aeroflex Labs. Div.
American Electronics, Inc., Data-Tronics Div.
American Research & Mfg. Corp.
Analogue Controls, Inc.
Barber-Colman Co.
Bowmar Instrument Corp.
Burroughs Corp.
CDC Control Services, Inc.
Consolidated Controls Corp.
Frank R. Cook Co.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
*EASTERN INDUSTRIES, INC.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronic Associates, Inc.
Exact Engrg. & Mfg. Inc.
Fairfield Engineering Corp.
Feedback Controls, Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
Goodyear Aircraft Corp.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Hydra-Power Corp.
Industrial Control Co.
Kearfott Co., Inc.
North Atlantic Industries, Inc.
Intercontinental Dynamics Corp.
Kelsey-Hayes Co.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
*WALLACE O. LEONARD, INC.
Librascope Inc.
Link Aviation, Inc.
Lumen, Inc.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Motordyne Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Reeves Instrument Corp.
Reid Metal Products, Inc.
Royal Industries, Inc.
Ryan Aeronautical Co.
Servo Corp. of America
Servomechanisms, Inc.
Servomechanisms, Inc., Mechatrol Div.
Skiatron Electronics & Television Corp.
Spectrol Electronics Div., Carrier Corp.
Telectro Industries Corp.
M. Ten Bosch, Inc.
Thompson Products, Inc.
United Control Corp.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
Wacline, Inc.
Weighing & Control Components, Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

Signal

Aeroflex Corp., The, Aeroflex Labs, Div.
Dunlap Electronics, Inc.
Exact Engrg. & Mfg. Inc.
General Railway Signal Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Varo Mfg. Co.

Tension

Consolidated Avionics Corp.
Dial Products Co.
Diehl Mfg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Timing

Abrams Instrument Corp.
Advanced Products Co., The
Amglo Corp.
Baird-Atomic, Inc.
Bowmar Instrument Corp.
Burroughs Corp.
Consolidated Avionics Corp.
*COOPER DEVELOPMENT CORP.
Joe Davidson & Associates
Dunlap Electronics, Inc.
Eagle Signal Corp.
Electronic Associates, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Elm Mfg. Co. Inc.
Exact Engrg. & Mfg. Inc.
Friez Instrument Div.-Bendix Aviation Corp.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hallamore Electronics Co.
Hamilton Watch Co., Military Products Div.
*A. W. HAYDON CO., THE
Haydon Div.-General Time Corp.
P. R. Mallory & Co. Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Spectrol Electronics Div., Carrier Corp.
Herman D. Steel Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
Tempo Instrument Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
Vacuum Tube Products Co. Inc.
Vemaline Products Co.
Waugh Engrg. Co.
*WESTINGHOUSE ELECTRIC CORP.
G. C. Wilson & Co.
Zenith Electric Co.

Torgue, Electronic

American Research & Mfg. Corp.
Consolidated Avionics Corp.
Dial Products Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Exact Engrg. & Mfg. Inc.
Librascope Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Voltage Regulator

Amelco, Inc.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Central Transformer Co.
Cubic Corp.
Curtiss-Wright Corp., Electronics Div.
Electric Regulator Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
E. Vernon Hill & Co.
Ford Instrument Co., Div.-Sperry Rand Corp.
Hoffman Electronics Corp., Semiconductor Div.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
Librascope Inc.
Lumen, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Motordyne Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Tempo Instrument Inc.
United Transformer Corp.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Volume

Clarostat Mfg. Co., Inc.
Daven Co., The
P. R. Mallory & Co. Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Redmond Co., Inc.
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Spectrol Electronics Div., Carrier Corp.
Telectro Industries Corp.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.

CONVERTERS, ELECTRIC

Amelco, Inc.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Carter Motor Co.
Consolidated Avionics Corp.
Crescent Engrg. & Research Co.
Eicor Div.-F. L. Jacobs Co.
Electronic Techniques, Inc.
Electronics Corp. of America
Georator Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Jordan Electronics, Div.-Victoreen Instrument Co.
Leach Corp.
Magnavox Co., The
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Missile Engrg. Products, Inc.
*MOTOR GENERATOR CORP.
Motordyne Inc.
Opad Electric Co.
Power Sources, Inc.
RS Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Sangamo Electric Co.
Skiatron Electronics & Television Corp.
Small Motors Inc.
Talley Corp., The
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telkor, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Westinghouse Electric Corp.
Wickes Engrg. & Construction Co. Inc.

CONVERTERS, FIELD SEQUENTIAL

Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Varo Mfg. Co.

CONVERTERS, MICROWAVE

Aircom Inc.
Airtron, Inc.
Applied Research Inc.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
John Gombos Co., Inc.
Goodyear Aircraft Corp.
J-V-M Microwave Co.
Polarad Electronics Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Varo Mfg. Co.
Vectron, Inc.

COOLING SYSTEMS, ELECTRONIC

Calcor Corp., Aircraft Div.
Dunham-Bush, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Goodyear Aircraft Corp.
***KAHN & CO., INC.**
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Stainless Steel Products, Inc.
Task Corp.
Telectro Industries Corp.
Trane Co., The
United Control Corp.

COUPLING & PHASING UNITS

Airtron, Inc.
General Instrument Corp., Defense Products Div.
J-V-M Microwave Co.
E. F. Johnson Co.
Prodelin, Inc.
Ryan Aeronautical Co.
Varo Mfg. Co.

CRYSTAL CARTRIDGES

Magnavox Co., The
Shure Brothers, Inc.

CRYSTAL FILTERS

Airtron, Inc.
American Electronic Labs., Inc.
Bliley Electric Co.
Bulova Watch Co., Electronicus Div.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Hupp Electronics Co.
Hycon Eastern Inc.
James Knights Co., The
Lenkurt Electric Co., Inc.
McCoy Electronics Co.
Monitor Products Co.
Reeves-Hoffman Div.
Sage Laboratories, Inc.
Telectro Industries Corp.

CRYSTAL MOUNTS

Airtron, Inc.
Amerac Inc.
American Electronics Labs., Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Elm Mfg. Co. Inc.
Enflo Corp.
J-V-M Microwave Co.
McCoy Electronics Co.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Midland Mfg. Co., Inc.
Monitor Products Co.
Omega Labs., Inc.
Radar Design Corp.
Reeves-Hoffman Div.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Waveline, Inc.

CRYSTALS

Bliley Electric Co.
Bulova Watch Co., Electronics Div.
Clark Crystal Co.
Delta Chemical Works, Inc.
Eidson Electronic Co.
Hunt Corp., The
International Crystal Mfg. Co. Inc.
McCoy Electronics Co.
Midland Mfg. Co., Inc.
Monitor Products Co.
Motorola Inc., Military Marketing Div.
Northern Engrg. Laboratories Inc.
Premier Research Laboratories, Inc.
Reeves-Hoffman Div.
United States Dynamics Corp.

DAMPERS, CONTROL

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
CDC Control Services, Inc.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Hydra-Power Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Ozone Metal Products Corp.
Servomechanisms, Inc., Mechatrol Div.
Sesco Mfg., Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons

DELAY LINES

Alden Products Co.
Andersen Laboratories, Inc.
Richard D. Brew & Co., Inc.
Burnell & Co., Inc.
Burroughs Corp.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co., Inc.
Corning Glass Works
Daven Co., The
Digitronics Corp.
Ecs Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Ferranti Electric, Inc.
Fugle-Miller Labs, Inc.
General Instrument Corp., Defense Products Div.
Gray & Kuhn, Inc.
Gudeman Co., The
Librascope, Inc.
NYT Electronics, Inc.
Orbitran Co., Inc.
Philco Corp., Government & Industrial Divs.
Pulse Engrg., Inc.
Stewart-Warner Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
Vanguard Electronics Co.

Computer

Alden Products Co.
Andersen Laboratories, Inc.
Richard D. Brew & Co., Inc.
Carad Corp.
Computer Control Co., Inc.
Corning Glass Works
***DATA-CONTROL SYSTEMS, INC.**
Digitronics Corp.
ECS Corp.
Electronic Associates, Inc.
Ferranti Electric, Inc.
Filtron Co., Inc.
Gudeman Co., The
North Atlantic Industries, Inc.
Johnson Electronics, Inc.
Librascope, Inc.
NYT Electronics, Inc.
George A. Philbrick Researches, Inc.
Redman Electronics Corp.
Stewart-Warner Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.

Distributed-Constant Fixed

Richard D. Brew & Co., Inc.
Burnell & Co., Inc.
Central Coil Co., Inc.
***DATA-CONTROL SYSTEMS, INC.**
Digitronics Corp.
ECS Corp.
Filtron Co., Inc.
Fugle-Miller Labs, Inc.
Gray & Kuhn, Inc.
North Atlantic Industries, Inc.
Johnson Electronics, Inc.
NYT Electronics, Inc.
Pulse Engrg., Inc.
Stewart-Warner Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
Vanguard Electronics Co.

Digital

Richard D. Brew & Co., Inc.
Burroughs Corp.
Computer Control Co., Inc.
Corning Glass Works
Digitronics Corp.
ECS Corp.
Ferranti Electric, Inc.
Filtron Co., Inc.
Fugle-Miller Labs. Inc.
Gudeman Co., The
Johnson Electronics, Inc.
Librascope, Inc.
NYT Electronics, Inc.
Skiatron Electronics & Television Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tobe Deutschmann Corp.

Distributed-Constant Variable

Richard D. Brew & Co., Inc.
***DATA-CONTROL SYSTEMS, INC.**
Digitronics Corp.
ECS Corp.
Filtron Co., Inc.
Helipot Corp.
Johnson Electronics Inc.
Telectron Industries Inc.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.

Lumped-Constant Fixed

Aerolite Electronics Corp.
Richard D. Brew & Co., Inc.
Burnell & Co., Inc.
Carad Corp.
Digitronics Corp.
ECS Corp.
Electronic Associates, Inc.
Erie Resistor Inc.
Ferranti Electric Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Gray & Kuhn Inc.
Gudeman Co., The
Johnson Electronics Inc.
NYT Electronics, Inc.
Orbitran Co., Inc.
Redman Electronics Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Electronics Co.
Western Coil Products Co.

Lumped-Constant Variable

Richard D. Brew & Co., Inc.
***DATA-CONTROL SYSTEMS INC.**
Digitronics Corp.
Ecs Corp.
Electronic Associates, Inc.
Filtron Co., Inc.
Fugle-Miller Labs, Inc.
Gudeman Co., The
Johnson Electronics, Inc.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
Vanguard Electronics Co.

Printed Circuit

Richard D. Brew & Co., Inc.
Central Coil Co., Inc.
Ceramet Corp.
Cleveland Metal Specialties Co.
Computer Control Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Ecs Corp.
Fugle-Miller Labs, Inc.
Gudeman Co., The
Key Resistor Corp.
Librascope, Inc.
Milmanco
NYT Electronics, Inc.
Star Engraving Co., Ltd.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.

DELAY NETWORKS

Andersen Laboratories, Inc.
Richard D. Brew & Co., Inc.
Carad Corp.
***DATA-CONTROL SYSTEMS, INC.**
Ecs Corp.
Ferranti Electric, Inc.
Fugle-Miller Labs, Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Gray & Kuhn, Inc.
Johnson Electronics, Inc.
NYT Electronics, Inc.
Orbitran Co., Inc.
Philco Corp., Government & Industrial Divs.
Pulse Engrg., Inc.
Skiatron Electronics & Television Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tempo Instrument, Inc.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Electronics Co.
Waugh Engrg. Co.

DEMODULATORS, COMPUTER

Burroughs Corp.
Celco-Constantine Engrg. Laboratories Co.
***DATA-CONTROL SYSTEMS, INC.**
Goodyear Aircraft Corp.
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
Librascope, Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Telectro Industries Corp.

DESTRUCTORS AND ASSOCIATED MECHANISMS

Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Hamilton Watch Co., Military Products Div.

McCormick Selph Associates
Talco Engrg. Co., The
Technical Oil Tool Corp.
Telectro Industries Corp.
Winchester-West. Div.—Olin Mathieson Chem. Corp.

DETECTORS, MAGNETIC

Burroughs Corp.
***DALMO VICTOR CO., DIV.-TEXTRON, INC.**
Haller Raymond & Brown, Inc.
Hammett Electric Co.
Indiana Steel Products Co., Inc.
Telectro Industries Corp.

DETECTORS, SCINTILLATION

Baird-Atomic, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Instruments Div.-Philips Electronics, Inc.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Nuclear-Chicago Corp.
Skiatron Electronics & Television Corp.
***WESTINGHOUSE ELECTRIC CORP.**

DIAL CRYSTALS

Lancaster Glass Corp.
Sohl Co., The
Spartan Marking Corp.
Virginia Plak Co.

DIALS, COMPLETE

Ackerman Engravers, Inc.
Acromark Co., The
Allied Engraving & Stamping Co.
Borg Equipment Div.-The George W. Borg Corp.
Canadian Radium & Uranium Corp.
Hamilton Watch Co., Military Products Div.
Jodee Plastics Co.
Lytle Engrg. & Mfg. Co.
Print Loid, Inc.
Reeves Instrument Corp.
Sohl Co., The
Spartan Marking Corp.
Techniques, Inc.
Theta Instrument Corp.
United States Radium Corp.
Universal Unlimited, Inc.
Waldom Electronics, Inc.

DIODES

Bogue Electric Mfg. Co.
Bomac Laboratories, Inc.
Clevite Transistor Products, Div.-Clevite Corp.
Corning Glass Works
Fansteel Metallurgical Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Gahagan, Inc.
General Instrument Corp., Defense Products Div.
Hoffman Electronics Corp., Semiconductor Div.
Hughes Products, Hughes Aircraft Co., Semiconductor Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Sarkes Tarzian, Inc.
Telectro Industries Corp.
Transitron Electronic Corp.
United States Dynamics Corp.
***WESTINGHOUSE ELECTRIC CORP.**

DIRECTION FINDERS

Collins Radio Co.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown, Inc.
Kearfott Co., Inc.
Lane Electronics Mfg. Corp.
La Pointe Industries, Inc.
Lear, Inc.
Librascope, Inc.
Magnavox Co., The
Munston Mfg. & Service, Inc.
Servo Corp. of America
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products, Inc.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

DIRECTION FINDER ANTENNAS

Coaxial Connector Co., Inc.
Collins Radio Co.
Communications Co.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown, Inc.
Kearfott Co., Inc.
La Pointe Industries, Inc.
Lear, Inc.
Magnavox Co., The
Shaw Metal Products Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products, Inc.

Technical Appliance Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Westbury Electronics, Inc.

DIRECTIONAL GYROS

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Clary Dynamics
Collins Radio Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Geisler Labs.
General Electric Co., Appartus Sales Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Hamilton Watch Co., Military Products Div.
Kearfott Co., Inc.
La Pointe Industries, Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis Honeywell Regulator Co., Boston Div.
Pacific Scientific Co.
Reeves Instrument Corp.
Wave Particle Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

DIRECTORS, FLIGHT

Collins Radio Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Kearfott Co., Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Stavid Engrg. Inc.
Telectro Industries Corp.

DYNAMOMETERS

Bogue Electric Mfg. Co.
Joe Davidson & Associates
W. C. Dillon & Co., Inc.
Eaton Mfg. Co.
Electric Auto-Lite Co., The
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Kearfott Co., Inc.
Simpson Electric Co.
Telectro Industries Corp.
***WESTINGHOUSE ELECTRIC CORP.**

ENGINE CONTROL SYSTEMS

Acoustica Associates, Inc.
American Electronics, Inc., Data-Tronics Div.
CDC Control Services, Inc.
Consolidated Controls Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Kearfott Co., Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Marquardt Aircraft Co.
Mineapolis-Honeywell Regulator Co., Aeronautical Div.
Parameters, Inc.
Southwest Products Co.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

EXITERS, FIELD

Bogue Electric Mfg. Co.
Telectro Industries Corp.

EXTENSIONS, SHAFT

Aerolite Electronics Corp.

FILMS, CAPACITOR

Dilectrix Corp.
Electron Products Inc.

FILMS, PLASTIC FOR WOUND INSULATION

Allied Plastics Supply Corp.
Blaco Mfg. Co.
Dilectrix Corp.
Enflo Corp.
Sparta Mfg. Co.
Topper Mfg. Co., Inc.

FILTERS

Airtron, Inc.
Aladdin Electronics, Div.-Aladdin Industries Inc.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Research & Mfg. Corp.
Applied Research Inc.
Canoga Corp. of California
Carad Corp.

Collins Engrg. Corp.
Corning Glass Works
Cuno Engrg. Corp., The
D & R, Ltd.
Daven Co., The
Defiance Engrg. & Microwave Corp.
Dwyer Engrg. Co., Inc.
ECS Corp.
Electron Products Inc.
Electronic Transformer Co., Inc.
Gabriel Co., The, Gabriel Electronics Div.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Gudeman Co., The
Hermetic Seal Transformer Co., Div.-South-Western Industrial Electronics
Highland Engrg. Co.
Hycon Eastern Inc.
J-V-M Microwave Co.
Johnson Electronics Inc.
Lear, Inc.
Lenkurt Electric Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
Ortha Filter Corp.
Polyphase Instrument Co.
Prodelin Inc.
Ram Electronics Inc.
Sage Laboratories, Inc.
Spectrum Instruments, Inc.
Superex Electronics Corp.
Televiso Corp.
Tensor Electric Development Co., Inc.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Triad Transformer Corp.
Tuscon Instrument Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.

Antennas

Adler Electronics, Inc.
Aerovox Corp.
Airtron, Inc.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
***AMERICAN MACHINE FOUNDRY CO.**
Applied Research Inc.
Canoga Corp. of California
Corning Glass Works
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Electronic Transformer Co., Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Hycon Eastern Inc.
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics Inc.
La Pointe Industries Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
J. W. Miller Co.
Munston Mfg. & Service, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Ralph M. Parsons Co., The, Electronics Div.
Polyphase Instrument Co.
Prodelin Inc.
Production Research Corp.
Standard Electronics Div., Radio-Engrg. Labs. Inc.
Superex Electronics Corp.
Technical Appliance Corp.
Telectro Industries Corp.
Televiso Corp.
Tobe Deutschmann Corp.
Triad Transformer Corp.
Twix Mfg. Co., Inc.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Western Coil Products Co.

Audio

Aerovox Corp.
Airdesign Corp.
American Electronic Labs., Inc.
Browning Laboratories, Inc.
Burnell & Co., Inc.
Canoga Corp. of California
Chicago Electronic Engrg. Co., Inc.
D & R. Ltd.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
De Coursey Engrg. Lab.
Electronic Transformer Co., Inc.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Goslin Electric & Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Johnson Electronics Inc.
La Pointe Industries Inc.
Lenkurt Electric Co., Inc.
Lumen, Inc.
Munston Mfg. & Service, Inc.

. . . guidance

NYT Electronics, Inc.
National Coil Co.
Orbitran Co., Inc.
Ortho Filter Corp.
Ryan Aeronautical Co.
Saratoga Industries
Spectrum Instruments, Inc.
Telectro Industries Corp.
Televiso Corp.
Tensor Electric Development Co., Inc.
Tobe Deutschmann Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co. Inc.
Western Electro-Acoustic Lab.

Band Elimination

Adler Electronics, Inc.
Aerovox Corp.
Airdesign Corp.
American Electronic Labs., Inc.
Applied Research, Inc.
*BAUSCH & LOMB OPTICAL CO.
Bulova Watch Co., Electric Div.
Burnell & Co., Inc.
Canoga Corp. of California
Carad Corp.
Chicago Electronic Engrg. Co., Inc.
D & R, Ltd.
*DATA-CONTROL SYSTEMS, INC.
Daven Co., The
De Coursey Engrg. Lab.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Entron, Inc.
Filtron Co., Inc.
Fugle-Miller Labs, Inc.
General Instrument Corp., Defense Products Div.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hycon Eastern, Inc.
J-V-M Microwave Co.
Johnson Electronics, Inc.
La Pointe Industries, Inc.
Lenkurt Electric Co., Inc.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co
North Hills Electric Co., Inc.
Orbitran Co., Inc.
Ortho Filter Corp.
Polyphase Instrument Co.
Potter Co., The
Ram Electronics, Inc.
Sage Laboratories, Inc.
Saratoga Industries
Spectrum Instruments, Inc.
Telectro Industries Corp.
Televiso Corp.
Tobe Deutschmann Corp.
Transformers, Inc.
Triad Transformer Corp.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.

Band Pass

Airdesign Corp.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Research & Mfg. Corp.
Applied Research, Inc.
*BAUSCH & LOMB OPTICAL CO.
Bendix Aviation Corp., York Div.
Browning Laboratories, Inc.
Bulova Watch Co., Electric Div.
Burnell & Co., Inc.
Canoga Corp. of California
Carad Corp.
Chicago Electronic Engrg. Co., Inc.
D & R, Ltd.
*DATA-CONTROL SYSTEMS, INC.
Daven Co., The
De Coursey Engrg. Lab.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Ecs Corp.
Electronic Transformer Co., Inc.
Epsco, Inc.
Filtron Co., Inc.
Fugle-Miller Labs, Inc.
General Instrument Corp., Defense Products Div.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Hycon Eastern, Inc.
J-V-M Microwave Co.
Johnson Electronics, Inc.
Lenkurt Electric Co., Inc.
Microlab
J. W. Miller Co.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Orbitran Co., Inc.
Ortho Filter Corp.
Polyphase Instrument Co.
Potter Co., The
Pulse Engrg., Inc.
Ram Electronics, Inc.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Saratoga Industries
Spectrum Instruments, Inc.
Standard Electronics Div., Radio Engrg. Labs, Inc.
Telectro Industries Corp.
Televiso Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Electrodynamics, Div.-United Geophysical Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Western Coil Products Co.
Western Electro-Acoustic Lab.
*WESTINGHOUSE ELECTRIC CORP.

Continuously Variable

Adler Electronics, Inc.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Fugle-Miller Labs, Inc.
General Instrument Corp., Defense Products Div.
Johnson Electronics, Inc.
Microlab
Telectro Industries Corp.
Transformers, Inc.
Transonic, Inc.
Varo Mfg. Co.

Crystal

Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hycon Eastern, Inc.
James Knights Co., The
Lenkurt Electric Co., Inc.
McCoy Electronics Co.
Midland Mfg. Co., Inc.
Ortho Filter Corp.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Wright Electronics, Inc.

Electric Wave Section

Burnell & Co., Inc.
D & R, Ltd.
*DATA-CONTROL SYSTEMS, INC.
Daven Co., The
Diamond Antenna & Microwave Corp.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
J-V-M Microwave Co.
NYT Electronics, Inc.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Polyphase Instrument Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Tensor Electric Development Co. Inc.
Tobe Deutschmann Corp.
Transonic, Inc.
Triad Transformer Corp.
United Transformer Corp.

High Pass

Adler Electronics, Inc.
Aerovox Corp.
Airdesign Corp.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Canoga Corp. of California
Carad Corp.
Chicago Electronic Engrg. Co., Inc.
D & R, Ltd.
*DATA-CONTROL SYSTEMS, INC.
Daven Co., The
De Coursey Engrg. Lab.
Diamond Antenna & Microwave Corp.
Defiance Engrg. & Microwave Corp.
Ecs Corp.
Electronic Transformer Co., Inc.
Entron, Inc.
Filtron Co., Inc.
General Instrument Corp., Defense Products, Div.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
J-V-M Microwave Co.
Johnson Electronics, Inc.
Lenkurt Electric Co., Inc.
Microlab
J. W. Miller Co.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Orbitran Co., Inc.
Ortho Filter Corp.
Polyphase Instrument Co.
Potter Co., The
Pulse Engrg., Inc.
Sage Laboratories, Inc.
Saratoga Industries
Spectrum Instruments, Inc.
Superex Electronics Corp.
Telectro Industries Corp.
Televiso Corp.
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Tobe Deutschmann Corp.
Transformers, Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Mfg. Co.
Varo Mfg. Co.
Western Coil Products Co.
Western Electro-Acoustic Lab.

I-F

Aerovox Corp.
*BAUSCH & LOMB OPTICAL CO.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Canoga Corp. of California
Carad Corp.
Daven Co., The
De Coursey Engrg. Lab.
Dwyer Engrg. Co., Inc.
Fugle-Miller Co., Inc.
General Instrument Corp., Defense Products, Div.
Goslin Electric & Mfg. Co.
Gray & Kuhn, Inc.
Hycon Eastern, Inc.
Johnson Electronics, Inc.
J. W. Miller Co.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Polyphase Instrument Co.
Potter Co., The
RS Electronics Corp.
Ram Electronics, Inc.
Superex Electronics Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Tobe Deutschmann Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.

Interference

Aerovox Corp.
Airborne Accessories Corp.
American Electronic Labs., Inc.
Axel Electronics
De Coursey Engrg. Lab.
Eastman Kodak Co.
Electron Products, Inc.
Filtron Co., Inc.
Fugle-Miller Labs., Inc.
General Instrument Corp., Defense Products Div.
Gudeman Co., The
Hallett Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Interference Measurement Laboratory, Inc.
Johnson Electronics, Inc.
Microlab
J. W. Miller Co.
Ortho Filter Corp.
Potter Co., The
Superex Electronics Corp.
Telectro Industries Corp.
Televiso Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.

Low Pass

Adler Electronics, Inc.
Aerovox Corp.
Airdesign Corp.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Axel Electronics
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Canoga Corp. of California
Carad Corp.
Chicago Electronic Engrg. Co., Inc.
D & R, Ltd.
Daven Co., The
De Coursey Engrg. Lab.
Defiance Engrg. & Microwave Corp.

CONTACTS ENLARGED 8½ TIMES
UNION SWITCH & SIGNAL
MINIATURE RELAYS

Typical group of UNION High-Quality Miniature Relays. Special manufacturing techniques are used to provide quality relays in large quantities. Ultrasonic and jet abrasive cleaning provide clean material. Unique baking and evacuation processes guard against gassing in the relay.

UNION family of high-quality miniature relays is designed for dependable performance in guided missile environments

Do you need a relay to operate with unusual reliability under severe conditions of temperature, shock, and vibration? Or one that functions on low "dry-circuitry" loads? For AC or DC circuits? Or special applications? You can find almost any relay you need in the UNION line.

UNION Miniature Relays were originally developed for use in airborne and guided missile electronic equipment and meet or exceed the requirements of Mil-R-25018, Mil-R-6106C and Mil-R-5757C. Their reliability and small size have led to their use in many industrial applications such as traffic control systems, computers, resistance welders and other electronic equipment.

Look over the many types of UNION Miniature Relays available, as shown here, and write for our Bulletin 1014 containing complete information.

Outstanding Features

1. **Superior Contacts** Standard HI-LO contacts permit high loads and low loads to be handled at the same time in one relay. Dry-circuit contacts are available when utmost reliability is desired for low-level, dry-circuit loads.

2. **Coil Resistances** Available in standard case from .9 to 8750 ohms and in long case from 1.6 to 13,600 ohms.

3. **Temperature Rating** Class "A" −55°C to +85°C; Class "B" −65°C to +125°C.

4. **AC or DC Models** Nominal operating voltages from 1.5 to 160 volts DC; 115 volts, 60 to 400 C.P.S., AC. AC relays incorporate built-in rectifiers and have same reliability as DC relays.

5. **Types and Mountings** All relays available in 6PDT or 4PDT models, plug-in or solder-lug connections, and all the usual mountings.

6. **Special Relays** *Slow-acting relays* for applications requiring a differential between operate time of various relays; *Plate-circuit relays* which operate on less than 8 milliamperes; *Double-coil relays* with each coil enabling operation of the relay . . . available on special order.

UNION SWITCH & SIGNAL

DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY

PITTSBURGH 18, PENNSYLVANIA

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Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Ecs Corp.
Electronic Transformer Co., Inc.
Epsco, Inc.
Filtron Co., Inc.
Fugle-Miller Labs., Inc.
General Instrument Corp., Defense Products Div.
Gudeman Co., The
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics, Inc.
Lenkurt Electric Co., Inc.
Microlab
Microwave Development Labs., Inc.
J. W. Miller Co.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Orbitran Co., Inc.
Ortho Filter Corp.
Polyphase Instrument Co.
Potter Co., The
Pulse Engrg., Inc.
Sage Laboratories, Inc.
Saratoga Industries
Spectrum Instruments, Inc.
Superex Electronics Corp.
Telectro Industries Corp.
Televiso Corp.
Telonic Industries, Inc.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Transformer Corp.
Varo Mfg. Co.
Western Coil Products Co.
Western Electro-Acoustic Lab.

Microwave

Aerovox Corp.
Aircom, Inc.
Airtron, Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Applied Research, Inc.
Canoga Corp. of California
Continental Diamond Fibre Corp., Sub.—The Budd Co.
*DALMO VICTOR CO., DIV-TEXTRON, INC.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Dwyer Engrg. Co., Inc.
Thomas T. Fox Co.
General Instrument Corp., Defense Products Div.
John Gombos Co., Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
J-V-M Microwave Co.
Johnson Electronics, Inc.
La Pointe Industries, Inc.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
NYT Electronics, Inc.
Narda Microwave Corp., The
Polarad Electronics Corp.
Polyphase Instrument Co.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Sanders Associates, Inc.
Technical Appliance Corp.
Techniques, Inc.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Tobe Deutschmann Corp.
Transonic, Inc.
Uniwave, Inc.
Vanguard Electronics Co.
Varo Mfg. Co.
Waveline, Inc.
Waveguide, Inc.

Noise Suppressing

Aerovox Corp.
Airborne Accessories Corp.
Allied Witan Co., Inc.
Axel Electronics
*BAUSCH & LOMB OPTICAL CO.
Filtron Co., Inc.
Fugle-Miller Labs., Inc.
General Instrument Corp., Defense Products Div.
General Sound Control, Inc.
Gudeman Co., The
Hallett Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Interference Measurement Laboratory, Inc.
Johnson Electronics, Inc.
La Pointe Industries Inc.
P. R. Mallory & Co. Inc.
Microlab
J. W. Miller Co.
Ortho Filter Corp.
Polyphase Instrument Co.
Potter Co., The
Spectrum Instruments, Inc.
Telectro Industries Corp.
Televiso Corp.
Tobe Deutschmann Corp.
United Transformer Corp.
Varo Mfg. Co.

Polarizing

Dwyer Engrg. Co., Inc.
General Instrument Corp., Defense Products Div.
Telectro Industries Corp.
Transonic, Inc.

Radio

Aerovox Corp.
Browning Laboratories, Inc.
Bulova Watch Co., Electronics Div.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Johnson Electronics Inc.
La Pointe Industries Inc.
J. W. Miller Co.
National Coil Co.
Potter Co., The
Telectro Industries Corp.
Televiso Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
Varo Mfg. Co.

Radio Noise

Aerovox Corp.
Airborne Accessories Corp.
Axel Electronics
Electron Products Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Gudeman Co., The
Hermetic Seal Transformer Co., Div.—Southwestern Industrial Electronics
Interference Measurement Laboratory, Inc.
Johnson Electronics Inc.
La Pointe Industries Inc.
Lear, Inc.
Microlab
J. W. Miller Co.
Ortho Filter Corp.
Potter Co., The
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
Televiso Corp.
Tobe Deutschmann Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Vibration Research Labs., Inc.

R-F

Aerovox Corp.
Airborne Accessories Corp.
Aircom Inc.
Air-Maze Corp.
Airtron, Inc.
American Electronic Labs., Inc.
Applied Research Inc.
Blonder-Tongue Labs., Inc.
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Dwyer Engrg. Co., Inc.
Entron, Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
General Instrument Corp., Defense Products Div.
Gudeman Co., The
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics Inc.
Microlab
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Polarad Electronics Corp.
Polyphase Instrument Co.
Potter Co., The
Ram Electronics Inc.
Sage Laboratories, Inc.
Telectro Industries Corp.
Televiso Corp.
Telonic Industries, Inc.
Tobe Deutschmann Corp.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Western Coil Products Co.

Telemetering

Adler Electronics, Inc.
Aerovox Corp.
Airdesign Corp.
Aladdin Electronics Div.-Aladdin Industries Inc.
American Electronic Labs., Inc.
*AVCO MFG. CORP., CROSLEY DIV.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Carad Corp.
D & R, Ltd.
*DATA-CONTROL SYSTEMS INC.
Daven Co., The
De Coursey Engrg. Lab.
Elco Corp.
Electronic Associates, Inc.
Electronic Transformer Co., Inc.
Epsco Inc.
Hermetic Seal Transformer Co., Div-Southwestern Industrial Electronics
Hycon Eastern Inc.
Johnson Electronics Inc.
La Pointe Industries Inc.
Lenkurt Electric Co., Inc.
Microlab
NYT Electronics, Inc.
Ortho Filter Corp.
Pacific Div-Bendix Aviation Corp.
Pulse Engrg., Inc.
Saratoga Industries
Spectrum Instruments, Inc.
Telectro Industries Corp.
*TELE-DYNAMICS INC.
Tobe Deutschmann Corp.
Transonic, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.

Uhf & Vhf

Aerovox Corp.
American Electronic Labs., Inc.
*AVCO MFG. CORP., CROSLEY DIV.
Canoga Corp. of California
Entron, Inc.
Filtron Co., Inc.
General Instrument Corp., Defense Products Div.
J-V-M Microwave Co.
Johnson Electronics Inc.
La Pointe Industries Inc.
Microlab
Narda Microwave Corp., The
National Coil Co.
Ortho Filter Corp.
Polarad Electronics Corp.
Radar Design Corp.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industrial Corp.
Tobe Deutschmann Corp.
Varo Mfg. Co.
Wright Zimmerman, Inc.

Vacuum System

International Pump & Machine Works
Spectrum Instruments, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Variable Electronic

Electronic Associates, Inc.
General Instrument Corp., Defense Products Div.
Johnson Electronics Inc.
La Pointe Industries Inc.
Ortho Filter Corp.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
Transonic, Inc.

Vestigial Sideband

Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Canoga Corp. of California
D & R, Ltd.
Daven Co., The
Johnson Electronics Inc.
Ortho Filter Corp.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Telectro Industries Corp.
Transonic, Inc.
United Transformer Corp.

Wave Trap

Aerovox Corp.
Bulova Watch Co., Electronics Div.
Fugle-Miller Labs., Inc.
General Instrument Corp., Defense Products Div.
La Pointe Industries, Inc.
Microwave Development Labs., Inc.
J. W. Miller Co.
National Coil Co.

North Hills Electric Co., Inc.
Ram Electronics, Inc.
Techniques, Inc.
Telectro Industries Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
United Transformer Corp.
Vanguard Electronics Co.
Western Coil Products Co.

FLANGES, MICROWAVE

Ainslie Corp.
Aircom, Inc.
Airtron, Inc.
Bendix Aviation Corp., York Div.
Coaxial Connector Co., Inc.
Connector Corp. of America
Co-Operative Industries, Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Dittmore-Freimuth Corp.
Douglas Microwave Co., Inc.
John Gombos Co., Inc.
J-V-M Microwave Co.
Kearfott Co., Inc.
Prodelin, Inc.
Radar Resign Corp.
Ryan Aeronautical Co.
Technical Appliance Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Uniwave, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Westbury Electronics, Inc.

FLIGHT DIRECTORS

Eclipse-Pioneer Div., Bendix Aviation Corp.
Kearfott, Co., Inc.
Kemlite Laboratories, Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Stavid Engrg., Inc.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America

FLIGHT TERMINATION DEVICES

McCormick Selph Associates
Minneapolis-Honeywell Regulator Co., Boston Div.
Telectro Industries Corp.
Ultradyne, Inc.
United Control Corp.

FREQUENCY METERS

Adler Electronics, Inc.
Aircom, Inc.
Airtron, Inc.
Computer-Measurements Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Dunlap Electronics, Inc.
Dynac, Inc.
Erie Resistor Corp.
General Communication Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
John Gombos Co., Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
National Coil Co.
Potter Aeronautical Corp.
Radar Design Corp.
Sage Laboratories, Inc.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Varo Mfg. Co.
Wacline, Inc.
Waugh Engrg. Co.
***WESTINGHOUSE ELECTRIC CORP.**

FUSES, INSTRUMENT

American Brass Co., The
Bussmann Mfg. Div., McGraw-Edison Co.
Librascope, Inc.
Sel-Rex Corp.
Sightmaster Corp.-Mutual Electronic Industries, Inc.
Telectro Industries Corp.

GERMANIUM

Accurate Specialties Co., Inc.
American Optical Co., Instrument Div.
Anchor Metal Co., Inc.
Belmont Smelting & Refining Work, Inc.
Bram Metallurgical & Chemical Co.
Eagle-Picher Co., The
Harmon, Lichtenstein & Co.
Hughes Products, Hughes Aircraft Co., Semiconductor Div.
Metals & Controls Corp.
Sel-Rex Corp.

GOLD

Accurate Specialties Co., Inc.
American Silver Co.
Anchor Metal Co., Inc.
Attleboro Refining Co., Inc.
Bram Metallurgical & Chemical Co.
Wilbur B. Driver Co.
Eastern Smelting & Refining Corp.
Engelhard Industries, Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Goldsmith Brothers Smelting & Refining Co.
Hamilton Watch Co., Military Products Div.
Handy & Harman
Harper-Leader, Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
J. M. Ney Co., The
Thieblot Aviation Co., Div.-Vitro Corp. of America
Tricon Mfg. Co.

GROUND LANDING SYSTEMS

Air Logistics Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
General Railway Signal Co.
Haller Raymond & Brown, Inc.
Irving Air Chute Co., Inc.
Minneapolis-Honeywell Regulator Co., Areonautical Div.
Motorola Inc., Military Marketing Div.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Ryan Aeronautical Co.
Security Parachute Co.
Skiatron Electronics & Television Corp.
Stewart-Warner Corp.
Sun Electric Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The
Wilcox Electric Co., Inc.

GUIDANCE EQUIPMENT, MISSILES

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Research & Mfg. Corp.
Analogue Controls, Inc.
Arma Div.-American Bosch Arma Corp.
Burroughs Corp.
Cadillac Gage Co.
Consolidated Avionics Corp.
Cubic Corp.
***DALMO VICTOR CO., DIV.-TEXTRON, INC.**
Davidson Mfg. Co.
Dwyer Engrg. Co., Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Ford Instrument Co., Div.-Sperry Rand Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
General Precision Lab.. Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
***HAYWARD SCIENTIFIC GLASS CORP.**
Hazeltine Electronics Div.-Hazeltine Corp.
Iron Fireman Mfg. Co., Electronics Div.
Lear, Inc., Grand Rapids Div.
Librascope, Inc.
Mechanical Div.-General Mills, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola, Inc., Military Marketing Div.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Perkin-Elmer Corp.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Royal Industries, Inc.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stewart-Warner Corp.
Sun Electric Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
***TELE-DYNAMICS INC.**
Thieblot Aviation Co., Div.-Vitro Corp. of America
Ultradyne, Inc.
Varo Mfg. Co.
Wave Particle Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

GUIDANCE SYSTEMS

American Optical Co., Instrument Div.
Analogue Controls, Inc.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Autonetics, Div.-North American Aviation, Inc.
***BAUSCH & LOMB OPTICAL CO.**
Burroughs Corp.
Canoga Corp. of California
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
General Electric Co., Apparatus Sales Div.
General Precision Lab. Inc.
Goodyear Aircraft Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haller Raymond & Brown Inc.
Hamilton Watch Co., Military Products Div.
***HAYWARD SCIENTIFIC GLASS CORP.**
Kearfott Co. Inc.
Lear, Inc.
Librascope Inc.
Mechanical Div.-General Mills, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Nuclear Products-Erco, Div.—ACF Industries Inc.
Pacific Div.-Bendix Aviation Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Wave Pacific Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Wilcox Electric Co., Inc.

Infrared

American Optical Co., Instrument Div.
Analogue Controls, Inc.
Atlantic Instrument Corp., Sub-American Electronics, Inc.
Baird-Atomic, Inc.
Barnes Engineering Co.
Eastman Kodak Co.
Electronic Communications, Inc.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Precision Lab. Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haller Raymond & Brown Inc.
Hoffman Electronics Corp., Semiconductor Div.
Infrared Industries Inc.
Kearfott Co., Inc.
Kemlite Laboratories, Inc.
Kopp Glass, Inc.
Librascope Inc.
Mechanical Div.-General Mills, Inc.
Mineapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Q. O. S. Corp.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Wollensak Optical Co.

Inertial

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Analogue Controls, Inc.
Arma Div.-American Bosch Arma Corp.

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Atlantic Instrument Corp., Sub-American Electronics, Inc.
Autonetics, Div.-North American Aviation, Inc.
Burroughs Corp.
Daystrom Pacific Div., Daystrom Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ford Instrument Co., Div.-Sperry Rand Corp.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.- General Mills, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telestro Industries Corp.
M. Ten Bosch, Inc.
Thieblot Aviation Co., Div.-Vitro Corp of America
Wave Particle Corp.

Radar

Airtron, Inc.
Analogue Controls, Inc.
Burroughs Corp.
Canoga Corp. of California
Coleman Engrg. Co., Inc.
*DALMO VICTOR CO., DIV.-TEXTRON, INC.
Daystrom Instrument Div., Daystrom, Inc.
Demornay-Bonardi
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Geisler Labs.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
Goodyear Aircraft Corp.
Hazeltine Electronics Div.-Hazeltine Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Kearfott Co., Inc.
Librascope Inc.
Magnavox Co., The
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Motorola Inc., Military Marketing Div.
Pacific Div.-Bendix Aviation Corp.
Philco Corp., Government & Industrial Divs.
Prodelin Inc.
RS Electronics Corp.
*RADIATION, INC.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Textran Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Wave Particle Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

Radio

Amelco, Inc.
Analogue Controls, Inc.
Burroughs Corp.
Coleman Engrg. Co., Inc.
Collins Radio Co.
*COOPER DEVELOPMENT CORP.
Cubic Corp.
*DATA-CONTROL SYSTEMS INC.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Lear, Inc.
Librascope Inc.
Mechanical Div.-General Mills, Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
*RADIATION, INC.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stewart Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
*WESTINGHOUSE ELECTRIC CORP.
Wilcox Electric Co., Inc.

Stellar

Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Davidson Mfg. Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Haller Raymond & Brown, Inc.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co., Inc.
Librascope, Inc.
Mechanical Div.-General Mills, Inc.
Motorola, Inc., Military Marketing Div.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America

Pilotless Aircraft

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
ACF Industries, Inc., Advanced Products Div.
Amelco, Inc.
Analogue Controls, Inc.
*COOPER DEVELOPMENT CORP.
*DATA-CONTROL SYSTEMS, INC.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Librascope, Inc.
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Motorola, Inc., Military Marketing Div.
Pacific Div.-Bendix Aviation Corp.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Ryan Aeronautical Corp.
Skiatron Electronics & Television Corp.
Tactair Valve Div.-Aircraft Products Co.
Telectro Industries Corp.
*TELE-DYNAMICS, INC.

GUIDED MISSILE TELEMETERING

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
Aircom, Inc.
Aircraft Armaments, Inc.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Research & Mfg. Corp.
Bendix Aviation Corp., York Div.
Briggs Associates, Inc.
Burroughs Corp.
Consolidated Avionics Corp.
*DATA-CONTROL SYSTEMS, INC.
Daystrom Instrument Div., Daystrom, Inc.
Dwyer Engrg. Co., Inc.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Epsco, Inc.
Farnsworth Electronics Co., Div.Int'l Telephone & Telegraph Corp.
Fenske Fedrick & Miller Co.
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
Hamilton Watch Co., Military Products Div.
Hogan Laboratories, Inc.
Hoover Electronics Co.
Kearfott Co., Inc.
La Pointe Industries, Inc.
*WALLACE O. LEONARD, INC.
Magnavox Co., The
Maico Electronics, Inc.
Mechanical Div.-General Mills, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Motorola, Inc., Military Marketing Div.
Mycalex Corp. of America
Pacific Div.-Bendix Aviation Corp.
Pacific Scientific Co.
Ralph M. Parsons Co., The, Electronics Div.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Prodelin, Inc.
*RADIATION, INC.
Reeves Instrument Corp.
Resdel Engrg. Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CO.
*RHEEM MFG. CO., ELECTRONICS DIV.
Rome Cable Corp.
Ryan Aeronautical Co.
Seeburg Corp., The
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products, Inc.
Talley Corp., The
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELE-DYNAMICS, INC.
*TELERAD MFG. CORP.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Ultradyne, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Varo Mfg. Co.
Victory Engineering Corp.

GYROS

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
Aeroflex Corp., The, Aeroflex Labs. Div.
*R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Autonetics, Div.-North American Aviation, Inc.
Clary Dynamics
Collins Engrg. Corp.
Joe Davidson & Associates
Daystrom Pacific Div., Daystrom, Inc.
Fairchild Controls Corp., Components Div.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Graflex, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
Hamilton Watch Co., Military Products Div.
Humphrey, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Kearfott Co., Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Reeves Instrument Corp.
Sanders Associates, Inc.
Wave Particle Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Attitude

Aeroflex Corp., The, Aeroflex Labs. Div.
Autonetics, Div.-North American Aviation, Inc.
Clary Dynamics
Daystrom Pacific Div., Daystrom, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Humphrey, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Kearfott Co., Inc.
Lear, Inc.
Leaf, Inc., Grand Rapids Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Pacific Scientific Co.
Reeves Instrument Corp.
Wave Particle Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Directional

Aeroflex Corp., The, Aeroflex Labs. Div.
Autonetics, Div.-North American Aviation, Inc.
Clary Dynamics
Daystrom Pacific Div., Daystrom, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Humphrey, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Javelin Aircraft Co., Inc.
Kearfott Co., Inc.
La Pointe Industries, Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Pacific Scientific Co.
Wave Particle Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Free

Aeroflex Corp., The, Aeroflex Labs. Div.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Clary Dynamics
Daystrom Pacific Div., Daystrom, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geisler Labs.

General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Kearfott Co., Inc.
La Pointe Industries, Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Boston Div.
Wave Particle Corp.
Whittaker Gyro. Div.-Telecomputing Corp.

Integrating

Aeroflex Corp., The, Aeroflex Labs. Div.
Atlantic Instrument Corp., Sub—American Electronics, Inc.
Daystrom Pacific Div., Daystrom, Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Humphrey, Inc.
Learfott Co., Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Reeves Instrument Corp.
M. Ten Bosch, Inc.
Wave Particle Corp.

Missiles

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
Aeroflex Corp., The, Aeroflex Labs Div.
*R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Clary Dynamics
Daystrom Pacific Div., Daystrom, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Ford Instrument Co., Div.-Sperry Rand Corp.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industires, Inc.
Humphrey, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Kearfott Co., Inc.
Lear, Inc., Grand Rapids Div.
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Pacific Scientific Co.
Reeves Instrument Corp.
Wave Particle Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Rate

Aeroflex Corp., The, Aeroflex Labs. Div.
*R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Cedar Engrg. Div.-Control Data Corp.
Clary Dynamics
Daystrom Pacific Div., Daystrom, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Fairchild Controls Corp., Components Div.
Ford Instrument Co., Div.-Sperry Rand Corp.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Humphrey, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Javelin Aircraft Co., Inc.
Kearfott Co., Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Pacific Scientific Co.
Reeves Instrument Corp.
Sanders Associates, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
Wave Particle Corp.
*WESTINGHOUSE ELECTRIC CORP.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Whittaker Gyro, Div.-Telecomputing Corp.

GYROSCOPES

Aeroflex Corp., The, Aeroflex Labs. Div.
American Electronics, Inc.
Arma Div.-American Bosch Arma Corp.
Cedar Engrg. Div.-Control Data Corp.
Clary Dynamics
Eclipse-Pioneer Div., Bendix Aviation Corp.
Ford Instrument Co., Div.-Sperry Rand Corp.
*GARRETT CORP., THE, AIRESEARCH MFG., DIVS.
General Electric Co., Apparatus Sales Div.
Geenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Hamilton Watch Co., Military Products Div.
Iron Fireman Mfg. Co., Electronics Div.
Kearfott Co., Inc.
Lear, Inc., Grand Rapids Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Reeves Instrument Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

HARNESSES, ELECTRIC

ACF Industries, Inc., Advanced Products Div.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alden Products Co.
*AMERICAN MACHINE & FOUNDRY CO.
American Super-Temperature Wires, Inc.
Anchor Specialty Mfg. Co., Inc.
Beaton & Corbin Mfg. Co., The
Bliss Electronic Corp.
Bogue Electric Mfg., Co.
Burroughs Corp.
California Technical Industries, Div.-Textron, Inc.
Coaxial Connector Co., Inc.
*COOPER DEVELOPMENT CORP.
Dayton Aircraft Products, Inc.
Dwyer Engrg. Co., Inc.
Elco Corp.
Electric Parts Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Empire Electronics Co., Inc.
Essex Mfg. Co., Inc.
First Electronics Corp., The
General Instrument Corp., Defense Products Div.
Geenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Guardian Electric Mfg. Co.
Gudebrod Bros. Silk Co., Inc.
Hallett Mfg. Co.
Hammett Electric Co.
Harco Labs., Inc.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
*KAHN & CO., INC.
Kilgen Aircraft Div.-The Kilgen Organ Co.
Kulka Electric Corp.
Lane Electronics Mfg. Corp.
Lear, Inc.
Lenkurt Electric Co., Inc.
Lytle Engrg. & Mfg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Mutron Corp.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Packard Electric Div.-General Motors Corp.
Resdel Engrg. Corp.
Rowe Industries
Schaffer Air Industries, Inc.
Skytronics
Superex Electronics Corp.
Surprenant Mfg. Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Titeflex, Inc.
Transvision, Inc.
Tri-Dex Co.
Tucson Instrument Corp.
Westbury Electronics, Inc.
Wilmar Mfg. Co., Inc.

HEADS, COMPUTER

General Transistor Western Corp.
Norton Associates, Inc.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Telectro Industries Corp
Tensor Electric Development Co., Inc.
Walkirt Co.

HOLDERS, CHASSIS

Alden Products Co.
G. M. Dykes Iron Works, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
United Mfg. Co., The

HOLDERS, CRYSTAL

Diamond Antenna & Microwave Corp.
Elm Mfg. Co., Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
J-V-M Microwave Co.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Telectro Industries Corp.
Uniwave, Inc.
Waldom Electronics, Inc.

HOLDERS, FUSE

Accurate Electronics Corp., Dept D
Alden Products Co.
H. Braun Tool & Instrument Co., Inc.
Bussmann Mfg. Div., McGraw-Edison Co.
Garde Mfg. Co.
Hobson Brothers, Inc.
Kolton Electric Mfg. Co.
Kulka Electric Corp.
Molding Corp. of America
Narda Microwave Corp., The
Neosil Products Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

HORNS, MICROWAVE

Ainslie Corp.
Aircom, Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
Bogart Mfg. Corp.
Canoga Corp. of California
*DALMO VICTOR CO., DIV.-TEXTRON, INC.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Gabriel Co., The Gabriel Electronics Div.
General Communication Co.
General Instrument Corp., Defense Products Div.
John Gombos Co., Inc.
Goodyear Aircraft Corp.
Hoover Electronics Co.
J-V-M Microwave Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Omega Labs., Inc.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Technical Appliance Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Waveline, Inc.
Waveguide, Inc.
Westbury Electronics Inc.

HORNS, SPEAKER PROJECTOR

Telectro Industries Corp.

INCLINOMETERS

Cadillac Gage Co.
Crescent Engrg. & Research Co.
Joe Davidson & Associates
*OPTO-METRIC TOOLS INC.
Telectro Industries Corp.

INDICATORS

Allard Instruments Corp.
Analogue Controls, Inc.
Crescent Engrg. & Research Co.
General Railway Signal Co.
Grimes Mfg. Co.
Haydon Div.-General Time Corp.
Hickok Electrical Instrument Co., The
Industrial Electronic Engineers
E. F. Johnson Co.
*KAHN & CO., INC.
Kearfott Co., Inc.
Leeds & Northrup Co.
*WALLACE O. LEONARD, INC.
Master Specialities Co.
Milman ngrg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Mineapolis-Honeywell Regulator Co., Boston Div.
Size Control Co.
Star Engraving Co., Ltd.
Telectro Industries Corp.
Tempil Corp.
Ultradyne, Inc.
*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.
United Control Corp.
Varo Mfg. Co.
Wacline, Inc.

INDUCTANCES, VARIABLE

Alto Scientific Co., Inc.
Burnell & Co., Inc.
CGS Labs., Inc.
Carad Corp.
Crescent Engrg. & Research Co.
General Instrument Corp., Defense Products Div.
Gray & Kuhn Inc.
E. F. Johnson Co.
Leeds & Northrup Co.
Magnetico, Inc.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
Superex Electronics Corp.
Telectro Industries Corp.
United Transformer Corp.
Vanguard Electronics Co.
Vari-L Co., Inc.

INDUCTORS

Aladdin Electronics, Div.-Aladdin Industries Inc.
American Research & Mfg. Corp.
Burnell & Co., Inc.
Carad Corp.

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Ferranti Electric Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
E. F. Johnson Co.
Lenkurt Electric Co., Inc.
Magnetico, Inc.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
Penta Labs, Inc.
Precision, Inc.
Sterling Transformer Corp.
Superex Electronics Corp.
Telectro Industries Corp.
Transformers, Inc.
Tresco, Inc.
United Transformer Corp.
Vanguard Electronics Co.
*WESTINGHOUSE ELECTRIC CORP.

INDUCTORS, COILS

Aladdin Electronics, Div. Aladdin Industries Inc.
American Research & Mfg. Corp.
Burnell & Co., Inc.
Carad Corp.
Ferranti Electric Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Infrared Industries Co.
E. F. Johnson Co.
Lenkurt Electric Co., Inc.
Magnetico, Inc.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
Superex Electronics Corp.
Telectro Industries Corp.
Tri-Dex Co.
United Transformer Corp.
Vanguard Electronics Co.

INFRARED DETECTION SYSTEMS

American Optical Co., Instrument Div.
Baird-Atomic, Inc.
Barnes Engineering Co.
Coleman Engrg. Co., Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Davidson Mfg. Co.
Eastman Kodak Co.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div.-United Aircraft Corp.
Farnsworth Electronics Co., Div.-Int'l. Telephone & Telegraph Corp.
General Instrument Corp., Defense Products Div.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haller Raymond & Brown Inc.
Infrared Industries Inc.
Metavac, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Motorola Inc., Military Marketing Div.
Optomechanisms Inc.
Philco Corp., Government & Industrial Divs.
Q. O. S. Corp.
Ryan Aeronautical Co.
Servo Corp. of America
Servomechanisms Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Westinghouse Electric Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Wollensak Optical Co.

INFRARED IMAGE CONVERTERS

Baird-Atomic, Inc.
Electronics Corp. of America
Farnsworth Electronics Co., Div.-Int'l. Telephone & Telegraph Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Infrared Industries Inc.
Motorola Inc., Military Marketing Div.
Q. O. S. Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

INFRARED SYSTEMS, GUIDANCE

American Optical Co., Instrument Div.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Baird-Atomic, Inc.
Barnes Engineering Co.
*BAUSCH & LOMB OPTICAL CO.
California Technical Industries, Div.-Textron Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Davidson Mfg. Co.
Eastman Kodak Co.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Farnsworth Electronics Co., Div.-Int'l. Telephone & Telegraph Corp.
General Instrument Corp., Defense Products Div.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haller Raymond & Brown Inc.
Infrared Industries Inc.
Kemlite Laboratories, Inc.
Mechanical Div.-General Mills, Inc.
Metavac, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Q. O. S. Corp.
Ryan Aeronautical Co.
Servo Corp. of America
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Westinghouse Electric Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Wollensak Optical Co.

INSTRUMENTS, ELECTRICAL MEASURING

Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
Assembly Products, Inc.
Associated Research, Inc.
Barnes Development Co.
Barton Instrument Corp.
Burroughs Corp.
Collins Engrg. Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Dynac, Inc.
Dynamic Instrument Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Tech Equipment Co.
Epic, Inc.
Fenske Fedrick & Miller Co.
John Fluke Mfg. Co., Inc.
General Communication Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
Industrial Instruments, Inc.
Instrument Laboratories
*KAHN & CO., INC.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Librascope, Inc.
Marion Electrical Instrument Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
National Coil Co.
Optimized Devices, Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S., Inc.
Reeves Instrument Corp.
Servomechanisms, Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transvision, Inc.
Varo Mfg. Co.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Ammeters

Assembly Products, Inc.
Cambridge Instrument Company, Inc.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters, Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
National Coil Co.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S., Inc.
*ROCHESTER MFG. CO. INC.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Stewart-Warner Corp.
Sun Electric Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Audiometers

General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Narda Microwave Corp., The
Sun Electric Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Bridges

Aerovox Corp.
General Electric Co., Apparatus Sales Div.
Barnes Development Co.
James G. Biddle Co.
Boonton Electronics Corp.
Cal-Ohm Labs., Inc.
Cambridge Instrument Company, Inc.
Computer Instruments Corp.
Consolidated Electrodynamics Corp.
Electro-Measurements, Inc.
Electro-Tech Equipment Co.
Elm Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Gertsch Products, Inc.
Gray Instrument Co.
Hallamore Electronics Co.
Hammett Electric Co.
Industrial Instruments, Inc.
*KAHN & CO., INC.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Optimized Devices, Inc.
Simmonds Aerocessories, Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Theta Instrument Corp.
*WESTINGHOUSE ELECTRIC CORP.

Calibrators

Allegany Instrument Co., Inc.
Ballantine Labs., Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Dunlap Electronics, Inc.
Dynac, Inc.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Fenske Fedrick & Miller Co.
John Fluke Mfg. Co., Inc.
General Communication Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Gertsch Products, Inc.
Gilmore Industries, Inc.
Gray Instrument Co.
Hallamore Electronics Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Hoover Electronics Co.
North Atlantic Industries, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Optimized Devices, Inc.
Orbitran Co., Inc.
Servomechanisms, Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transvision, Inc.

Comparators

Barnes Development Co.
Cambridge Instrument Company, Inc.
Cleveland Instrument Co.
Consolidated Avionics Corp.
Dynac, Inc.
General Communication Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
North Atlantic Industries, Inc.
Gerard G. Leeds Co., Inc.
Librascope, Inc.
Optimized Devices, Inc.
*OPTO-METRIC TOOLS, INC.
Sanders Associates, Inc.
Size Control Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transvision, Inc.
Varo Mfg. Co.

Circuit Linearity

Barnes Development Co.

Computer Instruments Corp.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Servomechanisms, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Transvision, Inc.

Comparators Voltage

Cubic Corp.
Davenport Mfg. Co.
Dynac, Inc.
General Electric Co., Apparatus Sales Div.
Gertsch Products, Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Garard G. Leeds Co., Inc.
Non-Linear Systems, Inc.
Optimized Devices, Inc.
Owen Labs., Inc.
Southwestern Industrial Electronics Co.
Systron Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Galvanometers

Assembly Products, Inc.
James G. Biddle Co.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Hathaway Instrument Div.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Heiland Div.-Minneapolis-Honyewell
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
J. A. Maurer, Inc.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Owens Labs., Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Magnetometers

Barnes Development Co.
Burroughs Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Telectro Industries Corp.
Terminal Radio Corp.

Megohmmeters

Associated Research, Inc.
James G. Biddle Co.
Brush Instruments, Div.-Clevite Corp.
Consolidated Airborne Systems, Inc.
Curtiss-Wright Corp., Electronics Div.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Industrial Instruments Inc.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
National Coil Co.
Precision Apparatus Co., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Microammeters

Assembly Products, Inc.
Barnes Development Co.
Computer Instruments Corp.
Curtiss-Wright Corp., Electronics Div.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Control Co.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
National Coil Co.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Microfaradmeters

Ballantine Labs., Inc.
Barnes Development Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Micro-Microammeters

Barnes Development Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
National Coil Co.
Simpson Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Milliammeters

Assembly Products, Inc.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Control Co.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Lewis Engrg. Co., The
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
National Coil Co.
Phaostron Instrument & Electronic Co., Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Science House, Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Millivoltmeters

Alto Scientific Co., Inc.
Assembly Products, Inc.
Ballantine Labs., Inc.
Boonton Electronics Corp.
Curtiss-Wright Corp., Electronics Div.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Fisher Research Lab., Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Gulton Industries, Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Control Co.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
National Coil Co.
Non-Linear Systems Inc.
Owen Labs., Inc.
Phaostron Instrument & Electranic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Thermo Electric Co., Inc.
Wacline, Inc.
Westinghouse Electric Corp.

Ohmmeters

Alto Scientific Co., Inc.
Associated Research, Inc.
Bergen Labs.
James G. Biddle Co.
Cubic Corp.
Davenport Mfg. Co.
Electronic Auto-Lite Co., The
Electronic Associates, Inc.
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Gray Instrument Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Instruments Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Meters Inc.
National Coil Co.
Non-Linear Devices, Inc.
Optimized Devices, Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Science House, Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Transvision, Inc.

Ratiometers

Allegany Instrument Co., Inc.
Computer-Measurements Corp.
Consolidated Avionics Corp.
Cubic Corp.
General Electric Co., Apparatus Sales Div.
Gertsch Products Inc.
Guardian Electric Mfg. Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Lewis Engrg. Co., The
Non-Linear Systems Inc.
Servomechanisms, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Recorders

Airborne Instruments Lab., Inc.
Allegany Instrument Co., Inc.
Antlab Inc.
Barton Instrument Corp.
Benson-Lehner Corp.
Bergen Labs.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Consolidated Electrodynamics Corp.
Curtiss-Wright Corp., Electronics Div.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Gilmore Industries Inc.
Guardian Electric Mfg. Co.
Hamilton Watch Co., Hathaway Instrument Div.
Hammett Electric Co.
Heiland Div.-Minneapolis-Honeywell
Hogan Laboratories, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Librascope Inc.
Massa Labs., Inc.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co., Davies Laboratories Div.
Minneapolis-Honeywell Regulator Co., Industrial Div.
F. L. Moseley Co.
Reeves Instrument Corp.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Tracers, Signal

Feiler Engrg. & Mfg. Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Voltmeters

Alto Scientific Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Assembly Products, Inc.
Ballantine Labs., Inc.
Bergen Labs.
Boonton Electronics Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
Daven Co., The
Davenport Mfg. Co.
Dejur-Amsco Corp.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electronic Associates, Inc.
Electronic Measurements Corp
Electro-Tech Equipment Co.

Epic, Inc.
Epsco Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Gulton Industries, Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Industrial Control Co.
North Atlantic Industries, Inc.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
F. L. Moseley Co.
National Coil Co.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Reeves Instrument Corp.
Science House, Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Systron Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transvision, Inc.
Wacline, Inc.
Waveforms, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Volt-Ohm-Millammeters

Bergen Labs.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Instrument Laboratories
Keithley Instruments, Inc.
Meters Inc.
National Coil Co.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transvision, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Wattmeters

Bergen Labs.
Cubic Corp.
Electro Impulse Lab., Inc.
Electro-Tech Equipment Co.
Epic, Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
National Coil Co.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

INSTRUMENTS, ELECTRICAL MEASURING METERS

Alto Scientific Co., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Amerac Inc.
American Research & Mfg. Corp.
Assembly Products, Inc.
Barnes Development Co.
Barton Instrument Corp.
Bergen Labs.
Boonton Radio Corp.
California Technical Industries, Div.-Textron Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Dittmore-Freimuth Corp.
Dynac, Inc.
Electric Auto-Lite Co., The
Electro-Measurements Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Tech Equipment Co.
General Communication Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
North Atlantic Industries, Inc.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Moisture Register Co.
National Coil Co.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Reeves Instrument Corp.
Servomechanisms, Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transvision, Inc.
Varo Mfg. Co.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Electronic Capacitance

Aerovox Corp.
American Electronics, Inc.
Ballantine Labs., Inc.
Barnes Development Co.
Boonton Electronics Corp.
Consolidated Airborne Systems, Inc.
Electro-Measurements Inc.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Industrial Television Inc.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Optimized Devices, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transvision, Inc.

Field Strength

Dunlap Electronics, Inc.
Empire Products Sales Corp.
Ferris Instrument Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Nems Clarke Co., Div.-Vitro Corp. of America
*KAHN & CO., INC.
Gerard G. Leeds Co., Inc.
Polarad Electronics Corp.
Saratoga Industries
Simpson Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.

F-M Deviation

Browning Laboratories, Inc.
Gertsch Products Inc.
Hammett Electric Co.
Lampkin Labs., Inc.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Panoramic Radio Products, Inc.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Frequency

Adler Electronics, Inc.
Aircom Inc.
Amerac Inc.
American Research & Mfg. Corp.
BJ Electronics, Borg-Warner Corp.
James G. Biddle Co.
Brush Instruments, Div.-Clevite Corp.
Computer-Measurements Corp.
Consolidated Airborne Systems, Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Dynac, Inc.
Electro Impulse Lab., Inc.
Elm Mfg. Co. Inc.
General Communication Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Gertsch Products Inc.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Lampkin Labs., Inc.
Lavoie Labs., Inc.
Gerald G. Leeds Co., Inc.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Saratoga Industries
Systron Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Varo Mfg. Co.
Wacline, Inc.
Waugh Engrg. Co.
*WESTINGHOUSE ELECTRIC CORP.

Impedance

Alto Scientific Co., Inc.
BJ Electronics, Borg-Warner Corp.
Barnes Development Co.
Boonton Radio Corp.
Electro-Measurements Inc.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
North Atlantic Industries, Inc.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Modulation

Browning Laboratories, Inc.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Kay Electric Co.
Lampkin Labs., Inc.
Gerard G. Leeds Co., Inc.
Panoramic Radio Products, Inc.
Reeves Instrument Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Ultradyne, Inc.
Varo Mfg. Co.

Null

Advance Industries, Inc.
American Electronics, Inc.
Ballantine Labs., Inc.
Barnes Development Co.
Boonton Electronics Corp.
Computer Instruments Corp.
Curtiss-Wright Corp., Electronics Div.
John Fluke Mfg. Co., Inc.
Gertsch Products Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Industrial Control Co.
North Atlantic Industries, Inc.
Leeds & Northrup Co.
Marion Electrical Instrument Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Optimized Devices, Inc.
Q. V. S. Inc.
Reeves Instrument Corp.
Servomechanisms, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Trio Laboratories, Inc.
Ultradyne, Inc.
Varo Mfg. Co.
Vemaline Products Co.
Wacline, Inc.
Weinschel Engrg.

Output

American Electronics, Inc.
Daven Co., The
Dejur-Amsco Corp.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Marion Electrical Instrument Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Panel

Assembly Products, Inc.
Atlantic Engravers, Inc.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Marion Electrical Instrument Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Trio Laboratories, Inc.
Wacline, Inc.

Phase Angle

Acton Laboratories Inc.
Bergen Labs.
*DATA-CONTROL SYSTEMS INC.
General Electric Co., Apparatus Sales Div.
Gertsch Products Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The

North Atlantic Industries, Inc.
Panoramic Radio Products, Inc.
Ryan Aeronautical Co.
Telectro Industries Corp.
Terminal Radio Corp.
Theta Instrument Corp.
Trio Laboratories, Inc.
Varo Mfg. Co.
Vemaline Products Co.
*WESTINGHOUSE ELECTRIC CORP.
Weston Hydraulics, Ltd.
Wintronics

Power Factor

Acton Laboratories Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
North Atlantic Industries, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Q

Boonton Radio Corp.
Hammett Electric Co.
Kay Electric Co.
Marconi Instruments
Telectro Industries Corp.
Terminal Radio Corp.

Rf Power

Aircom Inc.
BJ Electronics, Borg-Warner Corp.
Brunswick Instruments
Cubic Corp.
Electro Impulse Lab., Inc.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Radar Design Corp.
Sun Electric Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Wacline, Inc.

Standing Wave Ratio

Aircom Inc.
Alto Scientific Co., Inc.
BJ Electronics, Borg-Warner Corp.
Browning Laboratories, Inc.
California Technical Industries, Div.-Textron Inc.
Cubic Corp.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Demornay-Bonardi
Geisler Labs.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
E. F. Johnson Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Omega Labs., Inc.
Radar Design Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Wacline, Inc.
Waveline, Inc.
Wave Particle Corp.

Wave

Amerac Inc.
General Communication Co.
Hammett Electric Co.
Kay Electric Co.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Panoramic Radio Products, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Uniwave, Inc.
Wacline, Inc.

X-Ray Intensity

Hammett Electric Co.
Instruments Div.-Philips Electronics, Inc.
Landsverk Electrometer Co.
Telectro Industries Corp.
Terminal Radio Corp.

INSTRUMENTS, GRAPHIC RECORDING

Acton Laboratories Inc.
Airborne Instruments Lab., Inc.
Alden Electronic & Impulse Recording Equip Co.
Allegany Instrument Co., Inc.
Antlab Inc.
Baird-Atomic, Inc.
Barnes Development Co.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Coleman Engrg. Co., Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
Electro-Tech Equipment Co.
Fischer & Porter Co.
*FLIGHT RESEARCH, INC.
General Electric Co., Apparatus Sales Div.
Gilmore Industries Inc.
Hammett Electric Co.
Heiland Div.-Minneapolis-Honeywell
Hogan Laboratories, Inc.
Instruments Corp., The
Kay Electric Co.
Leeds & Northrup Co.
Librascope Inc.
Massa Labs., Inc.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
F. L. Moseley Co.
Palmer Thermometers, Inc.
Reeves Instrument Corp.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Vought Co.
*WESTINGHOUSE ELECTRIC CORP.

INSULATORS

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Birnbach Radio Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd
Wilbur B. Driver Co.
Dwyer Engrg. Co., Inc.
Emerson Plastics Corp.
Enflo Corp.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
General Ceramics Corp.
Joclin Mfg. Co.
E. F. Johnson Co.
Walter Lee Chemical Corp.
Leeds & Northrup Co.
Litton Industries, Components Div.
Maryland Lava Co.
Palmer Theromometers, Inc.
Rubbercraft Corp. of California
Saxonburg Ceramics
Silicone Insulation, Inc.
Spruce Pine Mica Co.
D. M. Steward Mfg. Co.
Surprenant Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Synthane Corp.

Antenna Insulators & Spring Assemblies

Aerolite Electronics Corp.
Coaxial Connector Co. Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dayton Aircraft Products, Inc.
Dittmore-Freimuth Corp.
Electric Auto-Lite Co., The
Garde Mfg. Co.
General Ceramics Corp.
Hi-Lo Manufacturing Corp.
Isolantite Mfg. Corp.
Janco Corp.
Joclin Mfg. Co.
E. F. Johnson Co.
La Pointe Industries Inc.
Lapp Insulator Co., Inc., Radio Specialties Div.
Permax Products Div., Chisholm-Rydre Co., Inc.
Prodelin Inc.
D. M. Steward Mfg. Co.
Telectro Industries Corp.
Terminal Radio Corp.
Tricraft Products Corp.
Wind Turbine Co.

Bead

Corning Glass Works
Emerson Plastics Corp.
General Ceramics Corp.
Isolantite Mfg. Corp.
Walter Lee Chemical Corp.
Saxonburg Ceramics
Terminal Radio Corp.

Bearing

Bound Brook Oil-Less Bearing Co.
Cleveland Graphite Bronze Co. Div.—Clevite Corp.
Emerson Plastics Corp.
Walter Lee Chemical Corp.
Terminal Radio Corp.

Can Liner

Du-Co Ceramics Co.
Terminal Radio Corp.

Ceramic

American Lava Corp.
Auburn Spark Plug Co., Inc.
Birnbach Radio Co., Inc.
Corning Glass Works
D'amonite Products Mfg. Co.
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Electrical Refractories Co., The
Electronic Mechanics, Inc.
Erie Resistor Corp.
General Ceramics Corp.
Isolantite Mfg. Corp.
Lapp Insulator Co., Inc., Radio Sspecialties Div.
Litton Industries, Components Div.
Maryland Lava Co.
Morgantite, Inc.
Chester Morton Electronics Corp.
Mycalex Corp. of America
National Ceramic Co.
Saxonburg Ceramics
D. M. Steward Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Terminal Radio Corp.
Thermo Materials, Inc.
Western Gold & Platinum
*WESTINGHOUSE ELECTRIC CORP.

Cord

Auburn Mfg. Co., The
Terminal Radio Corp.
Coupling
Du-Co Ceramics Co.
Emerson Plastics Corp.
Enflo Corp.
Isolantite Mfg. Corp.
Walter Lee Chemical Corp.
Litton Industries, Components Div.
Telectro Industries Corp.
Terminal Radio Corp.

Electric

Continental Diamond Fibre Corp., Sub.—The Budd Co.
Emerson Plastics Corp.
Hammett Electric Co.
Joclin Mfg. Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
Maryland Lava Co.
National Ceramic Co.
Peerless Products Industries
Saxonburg Ceramics
Silicone Insulation, Inc.
Surprenant Mfg. Co.
Telectro Industries Corp.
Terminal Radio Corp.

Fabricated

Accurate Electronics Corp., Dept D
Aero Leather Products Co.
Aerolite Electronics Corp.
Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Emerson Plastics Corp.
General Electric Co., Apparatus Sales Div.
General Gasket Inc.
Industrial Engravers Inc.
Joclin Mfg. Co.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Maryland Lava Co.
Peerless Products Industries
Rogers Corp.
Seaman Products
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Spruce Pine Mica Co.
Stevens Products, Inc.
Synthane Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Tri-Dex Co.
Tri-Point Plastics Inc.

Feeder Spreader

Birnbach Radio Co., Inc.
General Ceramics Corp.
Isolantite Mfg. Corp.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
National Ceramic Co.
Terminal Radio Corp.

Feed Through

Aerolite Electronics Corp.
Birnbach Radio Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Diamonite Products Mfg. Co.
Dittmore-Freimuth Corp.
Electronic Mechanics, Inc.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Ceramics Corp.
General Components Inc.
Goe Engrg. Co.
Hobson Brothers, Inc.
Isolantite Mfg. Corp.
Joclin Mfg. Co.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.

Walter Lee Chemical Corp.
Litton Industries, Components Div.
Maryland Lava Co.
Chester Morton Electronics Corp.
National Ceramic Co.
Peerless Products Industries
Terminal Radio Corp.
Wind Turbine Co.

Fused Quartz

Corning Glass Works
Hammett Electric Co.
Kemlite Laboratories, Inc.
Kopp Glass, Inc.
Terminal Radio Corp.

Glass Bonded Mica

Allied Plastics Supply Corp.
William Brand & Co., Inc.
Electronic Mechanics, Inc.
Mycalex Corp. of America
Terminal Radio Corp.

High Dielectric Paper

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
General Gasket Inc
L. O. F. Glass Fibers Co.
Rogers Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Hv Power Line

Contninetal Diamond Fibre Corp., Sub.—The Budd Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Telectro Industries Corp.
Terminal Radio Corp.

Laminated

Accurate Electronics Corp., Dept D
Allied Plastics Supply Corp.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dwyer Engrg. Co., Inc.
Emerson Plastics Corp.
Gasket, Packing & Specialty Co. Inc.
General Electric Co., Apparatus Sales Div.
New England Laminates Co., Inc.
Penn Fibre & Specialty Co., Inc.
St. Regis Paper Co.
Sealectric Switch & Relay Corp.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Synthane Corp.
Terminal Radio Corp.
Tingstol Co.
*WESTINGHOUSE ELECTRIC CORP.

Metallized Bushing

Ceramaseal, Inc.
Diamonite Products Mfg. Co.
Filmohm Corp.
General Ceramics Corp.
Lapp Insulator Co., Inc., Radio Specialties Div.
Magnetic Shield Div.—Perfection Mica Co.
Chester Morton Electronics Corp.
National Ceramic Corp.
Terminal Radio Corp.

Mica

Allied Plastics Supply Corp.
William Brand & Co., Inc.
Conector Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Mycalex Corp. of America
Spruce Pine Mica Co.
Sylvania Electric Products Inc., Parts Div.
Terminal Radio Corp.

Molded

Accurate Electronics Corp., Dept. D
Allied Plastics Supply Corp.
Biwax Corp.
Calfibe Co., Inc.
Connector Corp.
Continental Daimond Fibre Corp., Sub.—The Budd Co.
Emerson Plastics Corp.
Enflo Corp.
Epoxy Products, Inc., Div.—Joseph Waldman & Sons
Garde Mfg. Co.
Hays Mfg. Co.
Joclin Mfg. Co.
Walter Lee Chemical Corp.
Litton Industries, Components Div
Roberts Toledo Rubber Co., The
Rubbercraft Corp. of California
St. Regis Paper Co.
Silicone Insulation, Inc.
Sylvania Electric Products Inc., Parts Div.
Terminal Radio Corp.
Westlake Plastics, CrystalX Corp.

Plastic

Accurate Electronics Corp., Dept. D
Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.—The Borden Co., Resinite Dept.
Calfibe Co., Inc.
Connector Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electric Auto-Lite Co., The
Emeloid Co., Inc., The
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
Epoxy Products, Inc., Div.-Joseph Waldman & Sons
Franklin Fibre—Lamitex Corp.
Gasket, Packing & Specialty Co. Inc.
General Components Inc.
General Gasket Inc.
Hammett Electric Co.
Hays Mfg. Co.
Illumintronic Engrg. Co.
Joclin Mfg. Co.
Jodee Plastics Co.
Keystone Electronics Corp.
Walter Lee Chemical Corp.
Litton Industries, Components Div.
J. J. Monaghan Co., Inc.
New England Laminates Co., Inc.
New England Tape Co., Inc.
Olympic Plastics Co., Inc.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Resdel Corp.
Rex Corp., The
Rogers Corp.
St. Regis Paper Co.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Surprenant Mfg. Co.
Sylvania Electric Products Inc., Parts Div.
Synthane Corp.
Terminal Radio Corp.
Tri-Point Plastics, Inc.
Westlake Plastics, CrystalX Corp.

Rods

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.—The Borden Co., Resinite Dept.
Bram Metallurgical & Chemical Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Diamonite Products Mfg. Co.
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
Franklin Fibre-Lamitex Corp.
Illumitronic Engrg. Co.
Isolantite Mfg. Corp.
Jodee Plastics Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
Mycalex Corp. of America
Penn Fibre & Specialty Co., Inc.
Resdel Corp.
Rex Corp., The
Rogers Corp.
Rubbercraft Corp. of California
St. Regis Paper Co.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Synthane Corp.
Terminal Radio Corp.
Tri-Point Plastics, Inc.
Westlake Plastics, CrystalX Corp.
Wind Turbine Co.

Sheets

Allied Plastics Supply Corp.
Auburn Mfg. Co., The
Borden Chemical Co., The, Div.—The Borden Co., Resinite Dept.
Bram Metallurgical & Chemical Co.
William Brand & Co., Inc.
Calfibe Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
Diamonite Products Mfg. Co.
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
Epoxy Products, Inc., Div.—Joseph Waldman & Sons
Franklin Fibre-Lamitex Corp.
General Gasket, Inc.
Illumintronic Engrg. Co.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Magnetic Shield Div.—Perfection Mica Co.
Mycalex Corp. of America
New England Laminates Co., Inc.
Penn Fibre & Specialty Co., Inc.
Rex Corp., The
Rogers Corp.
Rubbercraft Corp. of California
St. Regis Paper Co.
Silicone Insulation, Inc.
Spaulding Fibre Co., Inc.
Synthane Corp.
Terminal Radio Corp.
Westlake Plastics, CrystalX Corp.

Shock

Columbia Research Labs.
Penn Fibre & Specialty Co., Inc.
Rubbercraft Corp. of California
Terminal Radio Corp.
Westlake Plastics, CrystalX Corp.

Sleeve

Allied Plastics Supply Corp.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Diamonite Products Mfg. Co.
Enflo Corp.
Epoxy Products, Inc., Div.—Joseph Waldman & Sons
Walter Lee Chemical Corp.
Maryland Lava Co.
Mycalex Corp. of America
Peerless Products Industries
Surprenant Mfg. Co.
Terminal Radio Corp.
Wind Turbine Co.

Standoff

Aerolite Electronics Corp.
Allied Plastics Supply Corp.
Birnbach Radio Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Diamonite Products Mfg. Co.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Ceramics Corp.
Goe Engrg. Co.
Hobson Brothers, Inc.
Isolantite Mfg. Corp.
Joclin Mfg. Co.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Litton Industries, Components Div.
Maryland Lava Co.
National Ceramic Co.
Permax Products Div., Chisholm-Ryder Co., Inc.
Spaulding Fibre Co., Inc.
Terminal Radio Corp.
Tri-Point Plastics, Inc.
Wind Turbine Co.

Strain

Birnbach Radio Co., Inc.
General Ceramics Corp.
Hamilton Watch Co., Hathaway Instrument Div.
Isolantite Mfg. Corp.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
National Ceramic Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wind Turbine Co.

Test Clip

Aerolite Electronics Corp.
Birnbach Radio Co., Inc.
Telectro Industries Corp.
Terminal Ralio Corp.

Thermal

Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Du-Co Ceramics Co.
Emerson Plastics Corp.
Joseph Kaye & Co.
Walter Lee Chemical Corp.
Maryland Lava Co.
Rogers Corp.
Rubatex Div., Great American Industries, Inc.
Silicone Insulation, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Thermocouple

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
Conax Corp.
Electric Auto-Lite Co., The
Harco Labs., Inc.
Isolantite Mfg. Corp.
Leeds & Northrup Co.
Maryland Lava Co.
Morgantite, Inc.
Norton Co.
Saxonburg Ceramics
Telectro Industries Corp.
Terminal Radio Corp.
Thermo Electric Co., Inc.

Tower

Emerson Plastics Corp.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
National Ceramic Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wind Turbine Co.

Transmitting Antenna

Birnbach Radio Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
***DORNE & MARGOLIN, INC.**
General Ceramics Corp.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
National Ceramic Co.
Prodelin, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Wind Turbine Co.

Shock and Vibration

Auburn Mfg. Co., The
Columbia Research Labs.
Joe Davidson & Associates
Federal Shock Mount Div.—The Korfund Co.
Robinson Aviation, Inc.
Ryan Aeronautical Co.
Seaman Products
Telectro Industries Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United Mfg. Co., The

INTEGRATING GYROS

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Clary Dynamics
Electronics Associates, Inc.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Greenleaf Mfg. Co., The, Div.—Mandrel Industries, Inc.
Kearfott Co., Inc.
La Pointe Industries, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Reeves Instrument Corp.
Telectro Industries Corp.
M. Ten Bosch, Inc.
Wave Particle Corp.

INTEGRATORS, ELECTRONIC

Acromag, Inc.
Advance Industries, Inc.
Airborne Instruments Lab., Inc.
Allegany Instrument Co., Inc.
American Electronics Inc., Data-Tronics Div.
Andersen Laboratories, Inc.
Burroughs Corp.
Dwyer Engrg. Co., Inc.
Goodyear Aircraft Corp.
Greenleaf Mfg. Co., The, Div.—Mandrel Industries, Inc.
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
Hammett Electric Co.
Kearfott Co., Inc.
Kelsey-Hayes Co.
Librascope, Inc.
Link Aviation, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Motordyne, Inc.
Motorola, Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Redmond Co., Inc.
Reeves Instrument Corp.
Servomechanisms, Inc.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.

INVERTERS

Airborne Accessories Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
American Research & Mfg. Corp.
American Television & Radio Co.
Avion Div., ACF Industries, Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Carter Motor Co.
Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electronic Associates, Inc.
Electronic Techniques, Inc.
General Instrument Corp., Defense Products Div.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hertner Electric Co., The
Mercury Electronic Co.
Motordyne Inc.
Ernst Norrman Laboratories
Opad Electric Co.
Sangamo Electric Co.
Sun Electric Corp.
TKM Electric Corp.
Talley Corp., The
Telectro Industries Corp.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wincharger Corp.

INVERTERS-DC-AC

Airborne Accessories Corp.
Alto Scientific Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Research & Mfg. Corp.
American Television & Radio Co.
Arnoux Corp.
Avion Div., ACF Industries, Inc.
Ballantine Labs., Inc.
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Carter Motor Co.
Crescent Engrg. & Research Co.
Eicor Div.—F. L. Jacobs Co.
Electronic Associates, Inc.
Electronic Techniques, Inc.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Georator Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
Hammett Electric Co.
Hertner Electric Co., The
***INTERELECTRONICS CORP.**
International Research Associates
Jordan Electronics, Div.—Victoreen Instrument Co.
Kaiser Aircraft & Electronics Div.—Kaiser Industries Corp.
Kurz & Root Co.
Magnavox Co., The
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Motordyne, Inc.
Motorola, Inc., Military Marketing Div.
Opad Electric Co.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Pesco Products Div.—Borg-Warner Corp.
Sangamo Electric Co.
Sun Electric Corp.
TKM Electric Corp.
Talley Corp., The
Telectro Industries Corp.
Telkor, Inc.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wincharger Corp.

ION TRAPS

Telectro Industries Corp.

ISOLATORS, MICROWAVE

Bogart Mfg. Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Joe Davidson & Associates
Microwave Electronics Div., Sperry Gyroscope Co.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Telectro Industries Corp.

JACK PANEL ASSEMBLIES

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Amatom Electronic Hardware Co., Inc.
Coaxial Connector Co., Inc.
Empire Electronics Co., Inc.
Hallamore Electronics Co.
Nems Clarke Co., Div.-Vitro Corp. of America
International Electric Industries, Inc.
Schaffer Air Industries, Inc.
Switchcraft, Inc.
Telectro Industries Corp.

JEWELS, GLASS

Richard H. Bird & Co., Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Kopp Glass, Inc.
Swiss Jewel Co.
Telectro Industries Corp.

JUNCTION BOXES AND PANELS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Airtron, Inc.
Bendix Aviation Corp., Red Bank Div.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
***COOPER DEVELOPMENT CORP.**
General Railway Signal Co.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Hallamore Electronics Co.
International Electric Industries, Inc.
Janco Corp
Kolton Electric Mfg. Co.
La Pointe Industries, Inc.
Henry & Miller Industries, Inc.
Schaffer Air Industries, Inc.
Swedlow Plastics Co.
Telectro Industries Corp.
Telkor, Inc.

JUNCTIONS, HYBRID, MICROWAVE

Bendix Aviation Corp., York Div.
Coaxial Connector Co., Inc.
Demornay-Bonardi
Douglas Microwave Co., Inc.
Goodyear Aircraft Corp.
Microwave Electronics Div., Sperry Gyroscope Co.
Omega Labs., Inc.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Technical Appliance Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**

KEYERS & COUPLERS

Bendix Aviation Corp., York Div.
Coaxial Connector Co., Inc.
***COOPER DEVELOPMENT CORP.**
General Instrument Corp., Defense Products Div.
Seeburg Corp., The
Telectro Industries Corp.

KEYERS

Advance Industries, Inc.
Consolidated Avionics Corp.
***COOPER DEVELOPMENT CORP.**
General Instrument Corp., Defense Products Div.
Instruments Corp., The
Jordan Electronics, Div.-Victoreen Instrument Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

KEYS & CODING EQUIPMENT

Advance Industries, Inc.
Instruments Corp., The
Seeburg Corp., The
Telectro Industries Corp.

KILOVOLTMETERS

Associated Research, Inc.
Davenport Mfg. Co.
Electric Design & Mfg. Co.
Ferranti Electric Inc.
General Electric Co., Apparatus Sales Div.
Gertsch Products Inc.
Hammett Electric Co.
Keithley Instruments, Inc.
Opad Electric Co.
Telectro Industries Corp.
Wacline, Inc.

LAMINATIONS, TRANSFORMER

Telectro Industries Corp.
J. H. Winn Inc.

LAMPS, INFRA-RED

Curtiss-Wright Corp., Industrial & Scientific Products Div.
Electronics Corp. of America
Kemlite Laboratories, Inc.
Radiant Lamp Corp.
Telectro Industries Corp.
Thieblot Aviatoin Co., Div.-Vitro Corp. of America
***WESTINGHOUSE ELECTRIC CORP.**

LANDING AIDS, ELECTRONIC

***AMERICAN MACHINE & FOUNDRY CO.**
Burroughs Corp.
Coleman Engrg. Co., Inc.
Edgerton, Germeshausen & Grier, Inc.
General Precision Lab. Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Star Engraving Co., Ltd.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Wilcox Electric Co., Inc.

LANDING SYSTEMS, INSTRUMENT

Lear, Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

LENSES, R-F

Ainslie Corp.
American Optical Co., Instrument Div.
Semon Bache & Co.
*BAUSCH & LOMB OPTICAL CO.
Buhl Optical Co.
General Instrument Corp., Defense Products Div.
Goodyear Aircraft Corp.
Microwave Electronics Div., Sperry Gyroscope Co.
Ryan Aeronautical Co.
Telectro Industries Corp.
Wollensak Optical Co.

LORAN SYSTEMS

Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Polarad Electronics Corp.
Telectro Industries Corp.

LUGS, CABLE-ELECTRIC

Amp Inc.
Amatom Electronic Hardware Co., Inc.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Hallett Mfg. Co.
Walter K. Jaros, Aircrafters
Kolton Electric Mfg. Co.

MAGNETS, ELECTRO

Crucible Steel Co. of America
James Cunningham Son & Co., Inc.
Cutler-Hammer, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Indiana Steel Products Co., Inc.
Telectro Industries Corp.

MAGNETS, FOCUSING

Arnold Engrg. Co., The
Cesco
Crucible Steel Co. of America
Indiana Steel Products Co., Inc.
Metallurgical Products Dept., General Electric Co.
Telectro Industries Corp.
Thomas & Skinner, Inc.

MAGNETS, PERMANENT

Arnold Engrg. Co., The
Barker Sales Co.
Crucible Steel Co. of America
Gabriel Co., The Gabriel Electronics Div.
General Electric Co., Apparatus Sales Div.
General Scientific Equipment Co.
Hamilton Watch Co., Military Products Dic.
Indiana Steel Products Co., Inc.
La Pointe Industries, Inc.
Metallurgical Products Dept., General Electric Co.
Narda Microwave Corp., The
Permag Corp.
Telectro Industries Corp.
Thermo Materials, Inc.
Thomas & Skinner, Inc.
*WESTINGHOUSE ELECTRIC CORP.

MICROWAVE ACCESSORIES

Ainslie Corp.
Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Allied Research & Engrg., Div.—Allied Record Mfg. Co.
Bendix Aviation Corp. York Div.
Bogart Mfg. Corp.
Canoga Corp. of California
Chemalloy Electronics Corp.
Coaxial Connector Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
*COOPER DEVELOPMENT CORP.
*DALMO VICTOR CO., DIV.—TEXTRON INC.
Joe Davidson & Associates
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Douglas Microwave Co., Inc.
Driaire, Inc.
Electro Impulse Lab., Inc.
Englehard Industries, Inc., D. E. Makepeace Div.
General Communication Co.
General R-F Fittings, Inc.
Goodyear Aircraft Corp.
Hensen Electronics Co.
John Gombos Co., Inc.
International Research Associates
Kearfott Co., Inc.
Metavac, Inc.
Microwave Electronics Div.—Sperry Gyroscope Co.
Nuclear Products-Erco, Div.—ACF Industries, Inc.
Omega Labs., Inc.
Paul & Beekman, Inc.
Polarad Electronics Corp.
Prodelin Inc.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Sanders Asociates, Inc.
Technical Appliance Corp.
Technical Oil Tool Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Tensor Electric Development Co., Inc.
Transco Products, Inc.
Uniwave, Inc.
Wacline, Inc.
*WASHINGTON ALUMINUM CO., INC.
Waveguide, Inc.

MONITORS

Cedar Engrg. Div.—Control Data Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro Impulse Lab., Inc.
Haller Raymond & Brown, Inc.
Lampkin Labs., Inc.
Gerard G. Leeds Co., Inc.
*RHEEM MFG. CO., ELECTRONICS DIV.
Setchell-Carlson Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Thermo Electric Co., Inc.
Thompson Products, Inc.
Varo Mfg. Co.

MOTORS

Advanced Products Co., The
Airborne Accessories Corp.
Air-Marine Motors, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Ashland Electric Products, Inc.
Bendix Aviation Corp., Red Bank Div.
Bodine Electric Co.
Bogue Electric Mfg. Co.
Bryant Gage & Spindle Div.—Bryant Chucking Grinder Co.
Celco-Constantine Engrg. Laboratories Co.
Joe Davidon & Associates
Diehl Mfg. Co.
Eastern Air Devices, Inc.
Eicor Div.—F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Indicator Co., Inc.
*GARRETT CORP., THE AIRESEARCH MFG. DIVS.
General Railway Signal Co.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Guided Missile Div.—De Havilland Aircraft of Canada, Ltd.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Hertner Electric Co., The
Instrument Motors
Jack & Heintz, Inc.
Lear, Inc.
Master Appliance Mfg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motordyne Inc.
National Pneumatic Co., Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Rae Motor Corp.
Redmond Co., Inc.
Rotron Mfg. Co.
Sundstrand Turbo Div.—Sundstrand Machine Tool Co.
Talley Corp., The
Task Corp.
Vickers, Inc., Div.—Sperry Rand
*WESTINGHOUSE ELECTRIC CORP.

Electric

Advanced Products Co., The
Airborne Accesories Corp.
Air-Marine Motors, Inc.
Allard Instrument Corp.
American Electronics, Inc.
Amglo Corp.
Ashland Electric Products, Inc.
Barber-Colman Co.
Bendix Aviation Corp., Red Bank Div.
Bodine Electric Co.
Bogue Electric Mfg. Co.
Bryant Gage & Spindle Div.—Bryant Chucking Grinder Co.
Celco-Constantine Engrg. Laboratories Co.
*CORNELIUS CO., THE
Joe Davidson & Associates
Diehl Mfg. Co.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Eicor Div.-F. L. Jacobs Co.
Electric Indicator Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Guided Missile Div.—De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hansen Mfg. Co., Inc.
Haydon Div.—General Time Corp.
Hertner Electric Co., The
Hoover Electric Co.
Instrument Motors
Jack & Heintz, Inc.
Kearfott Co., Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Motordyne, Inc.
Motorsearch Co.
National Pneumatic Co., Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Packard Electric Div.—General Motors Corp.
Pesco Products Div.—Borg-Warner Corp.
Rae Motor Corp.
Redmond Co., Inc.
Rotron Mfg. Co.
Servomechanisms, Inc.
Servomechanisms, Inc., Mechatrol Div.
Small Motors, Inc.
Talley Corp., The
Task Corp.
*VICKERS, INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
*WESTINGHOUSE ELECTRIC CORP.

Fluid

Hammett Electric Co.
Lear, Inc.
Oil-Dyne, Inc.
Pesco Products Div.—Borg-Warner Corp.
Sundstrand Aviation, Div.—Sundstrand Machine Tool Co.
Vickers, Inc., Div.—Sperry Rand

Fractional Hp

Advanced Products Co., The
Airborne Accessories Corp.
Air-Marine Motors, Inc.
American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Ashland Electric Products, Inc.
Barber-Colman Co.
Bendix Aviation Corp., Red Bank Div.
Bodine Electric Co.
Bryant Gage & Spindle Div.—Bryant Chucking Grinder Co.
*CORNELIUS CO., THE
Joe Davidson & Associates
Kearfott Co., Inc.
Diehl Mfg. Co.
Eastern Air Devices, Inc.
Eicor Div.—F. L. Jacobs Co.
Electric Indicator Co., Inc.
*GARRETT CORP., THE AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Gray & Huleguard, Inc.
Hammett Electric Co.
Hertner Electric Co., The
Instrument Motors
Jack & Heintz, Inc.
Lear, Inc.
Master Appliance Mfg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motordyne, Inc.
Motoresearch Co.
National Pneumatic Co., Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Pacific Div.—Bendix Aviation Corp.
Packard Electric Div.—General Motors Corp.
Rae Motor Corp.
Redmond Co., Inc.
Reflectone Corp., The
Rotron Mfg. Co.
Small Motors Inc.
Talley Corp., The
Task Corp.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
*WESTINGHOUSE ELECTRIC CORP.

Hysteresis

Advanced Products Co., The
Air-Marine Motors, Inc.
American Electronics, Inc.
Ashland Electric Products, Inc.
Bodine Electric Co.
Bryant Gage & Spindle Div., Bryant Chucking Grinder Co.
Cedar Engrg. Div.-Control Data Corp.
Celco-Constantine Engrg. Laboratories Co.
Joe Davidson & Associates
Eastern Air Devices, Inc.
Electric Indicator Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Hammett Electric Co.
Haydon Div.-General Time Corp.
Hertner Electric Co., The
Instrument Motors
Minneapolis-Honeywell Regulator Co., Aeronautical Div.

Minneapolis-Honeywell Regulator Co., Boston Div.
Motordyne Inc.
National Pneumatic Co., Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Servomechanisms, Inc., Mechatrol Div.
Talley Corp., The

Miniature

Advanced Products Co., The
Airborne Accessories Corp.
Air-Marine Motors, Inc.
Allard Instrument Corp.
American Electronics, Inc.
Ashland Electric Products, Inc.
Barber-Colman Co.
Bodine Electric Co.
Bryant Gage & Spindle Div., Bryant Chucking Grinder Co.
Celco-Constantine Engrg. Laboratories Co.
*CORNELIUS CO., THE
Joe Davidson & Associates
Diehl Mfg. Co.
Eastern Air Devices, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Hansen Mfg. Co., Inc.
Haydon Div.-General Time Corp.
Instrument Motors
Kearfott Co., Inc.
Land-Aid, Inc., Sub.-California Eastern Aviation, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Motordyne Inc.
Motoresearch Co.
National Pneumatic Co., Inc.
Oil-Dyne, Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Raymond Engrg. Laboratory, Inc.
Rotron Mfg. Co.
Ryan Aeronautical Co.
Small Motors, Inc.
Talley Corp., The
Task Corp.
Vickers Inc., Div.-Sperry Rand
Wacline, Inc.

Hydraulic

American Brake Shoe Co., Kellogg Div.
*AMERICAN MACHINE & FOUNDRY CO.
Bogue Electric Mfg. Co.
*CORNELIUS CO., THE
Hammett Electric Co.
Hydraulic Press Mfg. Co., The, Div-Koehring Co.
Kearfott Co., Inc.
New York Air Brake Co., The, Watertown Div.
Oil-Dyne, Inc.
Pesco Products Div.—Borg-Warner Corp.
Sundstrand Aviation, Div.-Sundstrand Machine Tool Co.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Task Corp.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.

Instrument

Advanced Products Co., The
Allard Instrument Corp.
American Electronics, Inc.
Barber-Colman Co.
Bodine Electric Co.
Cedar Engrg. Div.-Control Data Corp.
Diehl Mfg. Co.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Haydon Div.-General Time Corp.
Hertner Electric Co., The
Instrument Motors
Kearfott Co., Inc.
Land-Air, Inc., Sub.-California Eastern Aviation, Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Motordyne Inc.
National Pneumatic Co., Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Servomechanisms, Inc.
Small Motors, Inc.
Task Corp.
Wacline, Inc.

MULTIPLIERS

Amerac Inc.
American Research & Mfg. Corp.
Analogue Controls, Inc.
Consolidated Avionics Corp.
Exact Engrg. & Mfg., Inc.
Haller Raymond & Brown, Inc.
*INTERELECTRONICS CORP.
Phaostron Instrument & Electric Co.
Resdel Engrg. Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Crystal

Aircom Inc.
Demornay-Bonardi
Haller Raymond & Brown, Inc.
Hunt Corp., The
Microlab
August E. Miller Laboratories
Polarad Electronics Corp.
Resdel Engrg. Corp.
Terminal Radio Corp.

Diode

Electronic Associates, Inc.
Haller Raymond & Brown Inc.
Hoffman Electronics Corp., Semiconductor Div.
*INTERELECTRONICS CORP.
Polarad Electronics Corp.
Terminal Radio Corp.

Electronic

American Research & Mfg. Corp.
Atlantic Research Corp.
Consolidated Avionics Corp.
Electronic Associates, Inc.
Gertsch Products Inc.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Resdel Engrg. Corp.
Telechrome Mfg. Corp.
Terminal Radio Corp.

Frequency

Adler Electronics, Inc.
Aircom Inc.
Amerac Inc.
American Research & Mfg. Corp.
Consolidated Avionics Corp.
*COOPER DEVELOPMENT CORP.
Demornay-Bonardi
Douglas Microwave Co., Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haller Raymond & Brown Inc.
Hycon Eastern Inc.
*INTERELECTRONICS CORP.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Telechrome Mfg. Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Magnetic

Acromag Inc.
American Research & Mfg. Corp.
D & R, Ltd.
General Magnetics, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Lumen, Inc.
Terminal Radio Corp.

Servo

American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Analogue Controls, Inc.
Electronic Associates, Inc.
Exact Engrg. & Mfg. Inc.
Feedback Controls, Inc.
General Controls Co.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Kelsey-Hayes Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Oil-Dyne, Inc.
Servomechanisms, Inc.
Terminal Radio Corp.
Weston Hydraulics, Ltd.

Meter

General Electric Co., Apparatus Sales Div.
Haller Raymond & Brown Inc.
Terminal Radio Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Varo Mfg. Co.

NAVIGATION SYSTEMS

*AC SPARK PLUG DIV., GENERAL MOTOR CORP.
Advance Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Burroughs Corp.
Cubic Corp.
Dynavia Engrg. Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electromation Co.
Electronic Communications, Inc.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Fenske Fedrick & Miller Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
*HAYWARD SCIENTIFIC GLASS CORP.
Kinevox-Hallen
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Lear, Inc.
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Motorola Inc., Military Marketing Div.
Reeves Instrument Corp.
Reflectone Corp., The
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sanders Associates Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Wilcox Electric Co., Inc.

NUCLEAR BATTERIES

Elgin Micronics, West Coast Div.—Elgin National Watch Co.
Nuclear Corp. of America, Inc.
United States Radium Corp.

OMNIRANGE

General Instrument Corp., Defense Products Div.
Haller Raymond & Brown, Inc.
Lavoie Labs., Inc.
Munstron Mfg. & Service, Inc.
Simpson Electric Co.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

OMNIRANGE RECEIVERS

General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Munston Mfg. & Service, Inc.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

OSCILLATORS

Advance Industries, Inc.
Alpha Instrument Co.
Alto Scientific Co., Inc.
Amerac Inc.
American Research & Mfg. Corp.
BJ Electronics, Borg-Warner Corp.
Boonton Radio Corp.
Borg Equipment Div.-The George W. Borg Corp.
Bulova Watch Co., Electronics Div.
J. H. Bunnell & Co.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Dunlap Electronics, Inc.
Dynac, Inc.
Electronic Communications, Inc.
Electronics International Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Highland Engrg. Co.
*INTERELECTRONICS CORP.
Johnson Electronics Inc.
M F Electronics Co.
McKenna Labs.
August E. Miller Laboratories
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Precision Apparatus Co., Inc.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Ultradyne, Inc.
Varo Mfg. Co.

Audio

Alto Scientific Co., Inc.
Bulova Watch Co., Electronics Div.
J. H. Bunnell & Co.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
Dunlap Electronics, Inc.
Dynac, Inc.
Electromation Co.
Electronics International Co.
Elm Mfg. Co. Inc.
General Instrument Corp., Defense Products Div.
Gray Mfg. Co., The
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Highland Engrg. Co.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
*INTERELECTRONICS CORP.
International Research Associates
Johnson Electronics Inc.

. . . guidance

Kay Electric Co.
Kinevox-Hallen
La Pointe Industries Inc.
M F Electronics Co.
Munston Mfg. & Service, Inc.
Precision Apparatus Co., Inc.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Waveforms, Inc.

Audio Fork Controlled

Antlab Inc.
Bell & Gossett Co.
Dunlap Electronics, Inc.
*INTERELECTRONICS, INC.
International Research Associates
Johnson Electronics Inc.
M F Electronics Co.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Walkirt Co.

Audio Frequency

James G. Biddle Co.
Bulova Watch Co., Electronics Div.
J. H. Bunnell & Co.
Dunlap Electronics, Inc.
Dynac, Inc.
Electronics International Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Highland Engrg. Co.
*INTERELECTRONICS CORP.
International Research Associates
Johnson Electronics Inc.
Kay Electric Co.
La Pointe Industries Inc.
M F Electronics Co.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
*TELE-DYNAMICS INC.
Terminal Radio Corp.
Varo Mfg. Co.
Waveforms, Inc.

Cavity

Airborne Instruments Lab., Inc.
Aircom Inc.
Amerac Inc.
CGS Labs., Inc.
General Communication Co.
General Instrument Corp., Defense Products Div.
J-V-M Microwave Co.
Resdel Engrg. Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Code

Dunlap Electronics, Inc.
General Instrument Corp., Defense Products Div.
Johnson Electronics Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Crystal

Bliley Electric Co.
Borg Equipment Div.-The George W. Borg Corp.
Bulova Watch Co., Electronics Div.
*COOPER DEVELOPMENT CORP.
General Instrument Corp., Defense Products Div.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hupp Electronics Co.
Hycon Eastern Inc.
International Crystal Mfg. Co. Inc.
Kay Electric Co.
Manson Laboratories, Inc.
McCoy Electronics Co.
August E. Miller Laboratories
Northern Engrg. Laboratories Inc.
Resdel Engrg. Corp.
Seeburg Corp., The
Telectro Industries Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Walkirt Co.

Grid Dip

Alto Scientific Co., Inc.
General Instrument Corp., Defense Products Div.
Telectro Industries Corp.
Terminal Radio Corp.

Grid Dip—High Frequency & Vhf

Boonton Electronics Corp.
General Instrument Corp., Defense Products Div.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.

Microwave

Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Alfred Electronics
Amerac Inc.
Bendix Aviation Corp., York Div.
CGS Labs., Inc.
California Technical Industries, Div.-Textron Inc.
Canoga Corp. of California
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Dynac, Inc.
Geisler Labs.
General Communication Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Johnson Electronics Inc.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Technical Oil Tool Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Waveline, Inc.
Wave Particle Corp.
Weinschel Engrg.

Oven Crystal Control

Bulova Watch Co., Electronics Div.
Dunlap Electronics, Inc.
Hupp Electronics Co.
Hycon Eastern Inc.
Lavoie Labs., Inc.
Manson Laboratories, Inc.
August E. Miller Laboratories
Northern Engrg. Laboratories Inc.
Resdel Engrg. Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.

Pulse

Alto Scientific Co., Inc.
Amerac Inc.
Bendix Aviation Corp., York Div.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
ECS Corp.
Electromation Co.
Electro-Pulse, Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Johnson Electronics Inc.
Kay Electric Co.
Kinevox-Hallen
Resdel Engrg. Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Pushbutton

Consolidated Electrodynamics Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.

Radio Frequency

Alpha Instrument Co.
J. H. Bunnell & Co.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
Cubic Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
J-V-M Microwave Co.
Johnson Electronics Inc.
Kay Electric Co.
Manson Laboratories, Inc.
Munston Mfg. & Service, Inc.
Ralph M. Parsons Co., The, Electronics Div.
Precision Apparatus Co., Inc.
Resdel Engrg. Corp.
Seeburg Corp., The
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Terminal Radio Corp.

R-F

Advance Industries, Inc.
BJ Electronics, Borg-Warner Corp.
Boonton Radio Corp.
J. H. Bunnell & Co.
Canoga Corp. of California
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
Cubic Corp.
Diamond Antenna & Microwave Corp.
Electronic Communications, Inc.
Geisler Labs.
General Communication Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics Inc.
Kay Electric Co.
Lavoie Labs., Inc.
Manson Laboratories, Inc.
Ralph M. Parsons Co., The, Electronics Div.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Resdel Engrg. Corp.
Seeburg Corp., The
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Termnial Radio Corp.
Wave Particle Corp.

Sweep

Alfred Electronics
Boonton Radio Corp.
Bulova Watch Co., Electronics Div.
Dynac, Inc.
Geisler Labs.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Panoramic Radio Products, Inc.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Vari-L Co., Inc.
Wave Particle Corp.

Tuning Fork

American Research & Mfg. Corp.
Bell & Gossett Co.
James G. Biddle Co.
Hamilton Watch Co., Military Products Div.
*INTERELECTRONICS CORP.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Walkirt Co.

Ultra-Low Frequency

Bulova Watch Co., Electronics Div.
Haller Raymond & Brown Inc.
Johnson Electronics Inc.
*INTERELECTRONICS CORP.
Kay Electric Co.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Waveforms, Inc.

Ultrasonic

Acoustica Associates, Inc.
Arenberg Ultrasonic Laboratory, Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
D & R, Ltd.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Johnson Electronics Inc.
Kay Electric Co.
Massa Labs., Inc.
McKenna Labs.
Narda Ultrasonics Corp., The
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Terminal Industries Corp.
Terminal Radio Corp.
Waveforms, Inc.

Video Pattern

General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The

Johnson Electronics Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Thompson Products, Inc.

Video Range

Electronic Measurements Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Johnson Electronics Inc.
Kay Electric Co.
Skiatron Electronics & Television Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Terminal Radio Corp.

OSCILLOGRAPHS

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Electro-Medical Lab., Inc.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Hathaway Instrument Div.
Heiland Div.—Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
Hogan Laboratories, Inc.
Lavoie Labs., Inc.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Offner Electronics Inc.
Precision Apparatus Co., Inc.
Railway Communications Inc.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

OUTLETS, ANTENNA

Aerolite Electronics Corp.
Coaxial Connector Co. Inc.
Don-lan Electronics Co.
Haller Raymond & Brown Inc.
Prodelin Inc.
Technical Appliance Corp.
Telectro Industries Corp.

PAINTS

Arco Co., The
Samuel Cabot Inc.
Drilube Co.
Krylon, Inc.
Midland Paint & Varnish Co., The
Shannon Luminous Materials Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United States Varnish Co.
Vorac Co., The
Waldom Electronics Inc.

PANEL BOARDS, ELECTRIC

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Aero-Test Equipment Co., Inc.
Allied Plastics Supply Corp.
Coaxial Connector Co. Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Cutler-Hammer Inc.
Devco Engrg. Inc.
Eljay Corp.
Franklin Fibre-Lamitex Corp.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Gunnar Laboratories
Hammett Electric Co.
***KAHN & CO., INC.**
Kasar Mfg. & Distributing Co., Inc.
Kilgen Aircraft Div.-The Kilgen Organ Co.
Kolton Electric Mfg. Co.
Schaffer Air Industries, Inc.
Star Engraving Co., Ltd.
Sun Electric Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Tri-Point Plastics Inc.
Tucson Instrument Corp.
***WASHINGTON ALUMINUM CO., INC.**
***WESTINGHOUSE ELECTRIC CORP.**

PANELS

Accurate Electronics Corp., Dept. D
Ackerman Engravers, Inc.
Aerodex, Inc.
Aerolite Electronics Corp.
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
Atlantic Engravers, Inc.
Cedar Engrg. Div.-Control Data Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Eljay Corp.
Franklin Fibre-Lamitex Corp.
General Railway Signal Co.
***KAHN & CO., INC.**
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Spartan Marking Corp.
Star Engraving Co., Ltd.
Telectro Industries Corp.
***WASHINGTON ALUMINUM CO., INC.**

Fibre

Accurate Electronics Corp., Dept. D
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Fischer & Porter Co.
Franklin Fibre-Lamitex Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Spartan Marking Corp.
Star Engraving Co., Ltd.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America

Flight Instrument

Allied Plastics Supply Corp.
Canadian Radium & Uranium Corp.
Cleveland Metal Specialties Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Eljay Corp.
Lear, Inc.
Lumen, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Schaffer Air Industries, Inc.
Sightmaster Corp.-Mutual Electronics Industries Inc.
Spartan Marking Corp.
Star Engraving Co., Ltd.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
***WASHINGTON ALUMINUM CO., INC.**

Instrument

Acromark Co., The
Allied Engraving & Stamping Co.
Allied Plastics Supply Corp.
Canadian Radium & Uranium Corp.
Cedar Engrg. Div.-Control Data Corp.
Cleveland Metal Specialties Co.
Devco Engrg. Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Eljay Corp.
Falstrom Co.
Fischer & Porter Co.
Hallamore Electronics Co.
A. F. Holden Co., The
Industrial Engravers Inc.
***KAHN & CO., INC.**
Henry & Miller Industries, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Premier Metal Products Co.
Schaffer Air Industries, Inc.
Sightmaster Corp.-Mutual Electronic Industries, Inc.
Spartan Marking Corp.
Star Engraving Co., Ltd.
Sun Electric Corp.
Telectro Industries Corp.
United States Radium Corp.
Waldom Electronics Inc.
***WASHINGTON ALUMINUM CO., INC.**

Jack

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Eljay Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Schaffer Air Industries, Inc.
Star Engraving Co., Ltd.
Telectro Industries Corp.

Receiver & Transmitter

Communications Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Eljay Corp.
Industrial Engravers Inc.
Lane Electronics Mfg. Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Star Engraving Co., Ltd.
Telectro Industries Corp.

Relay Rack

Aerodex, Inc.
G. M. Dykes Iron Works, Inc.
General Railway Signal Co.
J-V-M Microwave Co.
Lenkurt Electric Co., Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Premier Metal Products Co.
Telectro Industries Corp.

PARABOLAS, MICROWAVE

Ainslie Corp.
American Electronic Labs., Inc.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Dwyer Engrg. Co., Inc.
Gabriel Co., The Gabriel Electronics Div.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
D. S. Kennedy & Co.
La Pointe Industries Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
***PHOENIX PRODUCTS CO.**
Prodelin Inc.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Spincraft, Inc.
Technical Appliance Corp.
Technical Oil Tool Corp.
***WASHINGTON ALUMINUM CO., THE**

PATCH CORDS, CONNECTORS

Alden Products Co.
America Super-Temperature Wires, Inc.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
Coaxial Connector Co. Inc.
Dunlap Electronics, Inc.
Electronic Techniques, Inc.
Empire Electronics Co., Inc.
Hallamore Electronics Co.
Hammett Electric Co.
International Electric Industries, Inc.
Joy Mfg. Co.
Pomona Electronics Co., Inc.
Switchcraft, Inc.
Telectro Industries Corp.
Western International Co.

PATCH CORDS, STUDIO

American Super-Temperature Wires, Inc.
Belden Mfg. Co.
Dunlap Electronics, Inc.
Empire Electronics Co., Inc.
Hallamore Electronics Co.
Hammett Electric Co.
International Electric Industries, Inc.
Lenkurt Electric Co., Inc.
Pomona Electronics Co., Inc.
Switchcraft, Inc.
Telectro Industries Corp.
Western International Co.

PATCH PANELS

AMP Inc.
Accurate Electronics Corp., Dept. D
Electronic Techniques, Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Hallamore Electronics Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Schaffer Air Industries, Inc.
Star Engraving Co., Ltd.
Stanley Aviation Corp.
Switchcraft, Inc.
Telectro Industries Corp.
Twix Mfg. Co., Inc.
United States Radium Corp.
Vector Electronic Co.

PERMEAMETERS, HIGH H

Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.

PERMEATERS, R-F

Hammett Electric Co.

PHOTO ETCHED COMPONENTS

Advance Industries, Inc.
Bendix Aviation Corp., York Div.
Cleveland Metal Specialties Co.
Cubic Corp.
Dwyer Engrg. Co., Inc.
Keil Engrg. Products
La Ponte Industries Inc.
Pacific Universal Products Corp.
Precision Circuits, Inc.
Radar Design Corp.
Sanders Associates, Inc.
Telectro Industries Corp.
Zenith Optical Laboratory

PILOTS, AUTOMATIC

American Research & Mfg. Corp.
Eclipse Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Globe Industries, Inc.
Goodyear Aircraft Corp.
Javelin Aircraft Co., Inc.
Kearfott Co., Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Tactair Valve Div.-Aircraft Products Co.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

PITOT TUBES

Aero Instrument Co.
Aero Research Instrument Co. Inc.
E. Vernon Hill & Co.
Kemp Aero Products, Div.-Kemp Inc.
Task Corp.

PLOTTERS, X-Y

Analogue Controls, Inc.
Antlab Inc.
Benson Lehner Corp.
Chesapeake Instrument Corp.
Electronic Associates, Inc.
Fenske Fedrick & Miller Co.
Gilmore Industries Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
F. L. Moseley Co.
Reeves Instrument Corp.
Sanders Associates, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

PLUG-IN-CIRCUIT UNITS

Advance Industries, Inc
Alden Products Co.
American Electronics, Inc., Data-Tronics Div.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Continental Connector Corp.
Cubic Corp.
Doty Acoustica Electronic Labs.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Electronic Engrg. Co. of California
Electronic Processes Corp. of California
Electronic Techniques, Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
International Electric Industries, Inc.
La Pointe Industries Inc.
Lytle Engrg. & Mfg. Co.
Methode Mfg. Corp.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Motorla Inc., Military Marketing Div.
NYT Electronics, Inc.
Precision Circuits, Inc.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Vector Electronic Co.
Walkirt Co.

PLUGS

Accurate Electronics Corp., Dept. D
Advance Industries, Inc.
Alden Products Co.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Circon Component Corp.
Coaxial Connector Co. Inc.
Continental Connector Corp.
Garde Mfg. Co.
General Railway Signal Co.
E. F. Johnson Co.
Librascope Inc.
Sylvania Electric Products Inc., Parts Div.
Vector Electronic Co.

Computer Board

Continental Diamond Fibre Corp., Sub.—The Budd Co.
Librascope Inc.
P. R. Malory & Co. Inc.
Methode Mfg. Corp.
Telectro Industries Corp.

Connector

Accurate Electronics Corp., Dept. D
Alden Products Co.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Cal-Ohm Labs., Inc.
Circon Component Corp.
Coaxial Connector Co. Inc.
Continental Connector Corp.
R. C. Dudek & Co.
Elco Corp.
Electronic Techniques, Inc.
Garde Mfg. Co.
Hobson Brothers, Inc.
Walter K. Jaros, Aircrafters
E. F. Johnson Co.
Kulka Electric Corp.
P. R. Malory & Co. Inc.
Methode Mfg. Corp.
Pyle-National Co., The
Scintilla Div., Bendix Aviation Corp.
Star Engraving Co., Ltd.
Sylvania Electric Products Inc., Parts Div.
Telectro Industries Corp.
Ucinite Co., The,—United-Carr Fastener Corp.

Dehydrator

Driaire, Inc.
Walter K. Jaros, Aircrafters
Telectro Industries Corp.
Universal Dynamics Corp.

Expansion

Continental Diamond Fibre Corp., Sub.—The Budd Co.
Walter K. Jaros, Aircrafters
Telectro Industries Corp.

Hardware

Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Birnbach Radio Co., Inc.
Carroll Pressed Metal, Inc.
Circon Component Corp.
Corbin Products Div.
Dumont Aircraft Fitting Co.
Kasar Mfg. & Distributing Co., Inc.
Litton Industries, Components Div.
Telectro Industries Corp.

Metallic

American Brass Co., The
Dumont Aircraft Fitting Co.
Kasar Mfg. & Distributing Co., Inc.
Keystone Electronics Corp.
Paul & Beekman, Inc.
Telectro Industries Corp.

Non Metallic

Circon Component Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Kasar Mfg. & Distributing Co., Inc.
Mica Fabricating Co.
Rubbercraft Corp. of California
Telectro Industries Corp.
Truxton Industries, Inc.
Vector Electronic Co.

Printed Circuit

Advance Industries, Inc.
Cal-Ohm Labs., Inc.
Circon Component Corp.
Cleveland Metal Specialties Co.
Continental Connector Corp.
Dunlap Electronics, Inc.
Elco Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Garde Mfg. Co.
*KOONTZ-WAGNER ELECTRIC CO., INC.
La Pointe Industries Inc.
Librascope Inc.
Litton Industries, Components Div.
Methode Mfg. Corp.
Milmanco
Star Engraving Co., Ltd.
Sylvania Electric Products Inc., Parts Div.
Techniques, Inc.
Telectro Industries Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United-Carr Fastener Corp.

Telephone

Alden Products Co.
Birnbach Radio Co., Inc.
Continental Connector Corp.
Emerson Plastics Corp.
P. R. Mallory & Co. Inc.
Richards Electrocraft, Inc.
Switchcraft, Inc.
Western International Co.

Terminal

Accurate Electronics Corp., Dept. D
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Continental Connector Corp.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Garde Mfg. Co.
General Railway Signal Co.
Hydro Molding Co. Inc.
Kulka Electric Corp.
Litton Industries, Components Div.
P. R. Mallory & Co. Inc.
Vinson Mfg. Co. Inc.

PNEUMATIC CONTROLS AND SYSTEMS

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
*AMERICAN MACHINE & FOUNDRY CO.
Auto-Control Labs., Inc.
Autonetics, Div.-North American Aviation, Inc.
Bridgwater Machine Co.
Cadillac Gage Co.
Consolidated Controls Corp.
*COOPER DEVELOPMENT CORP.
*CORNELIUS CO., THE
Devco Engrg. Inc.
Dynamic Controls Corp.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fischer & Porter Co.
Futurecraft Corp.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hydra-Power Corp.
*KAHN & CO., INC.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Koehler Aircraft Products Co., Inc.
Lear, Inc.
Marquardt Aircraft Co.
*WALLACE O. LEONARD, INC.
Lyndon Aircraft, Inc.
Ozone Metal Products Corp.
Parker Aircraft. Co.
Powers Regulator Co., The
Progressive Research & Development Co., Inc.
Research Controls
Ryan Aeronautical Co.
Scientific Instrument Co.
Servomechanisms, Inc.
Southwest Products Co.
Sun Electric Corp.
Tactair Valve Div.-Aircraft Products Co.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Transco Products, Inc.
United Control Corp.
*VALCOR ENGRG. CORP.
Vap-Air Div., Vapor Heating Corp.
Varo Mfg. Co.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

POSTS, BINDING

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Affiliated Screw Products Co.
Birnbach Radio Co., Inc.
Coaxial Connector Co. Inc.
Corbin Products Div.
Elco Corp.
E. F. Johnson Co.
Litton Industries, Components Div.
Malco Tool & Mfg. Co.
Telectro Industries Corp.
Waldom Electronics Inc.

POTENTIOMETER TRIMMERS

Ace Electronics Associates, Inc.
Anton Electronic Labs., Inc.
Borg Equipment Div.-The George W. Borg Corp.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Joe Davidson & Associates
Edcliff Instruments
Fairchild Controls Corp., Components Div.
General Controls Co.
Hammett Electric Co.
Helipot Corp.
Gerard G. Leeds Co., Inc.
Narda Microwave Corp., The
Precision Line Inc.
*SCHWEBER ELECTRONICS
Telectro Industries Corp.
Tucson Instrument Corp.

POTENTIOMETERS

Ace Electronics Associates, Inc.
Allegany Instrument Co., Inc.
American Electronics, Inc.
Analogue Controls, Inc.

Anton Electronic Labs., Inc.
Borg Equipment Div.-The George W. Borg Corp.
Brush Instruments, Div.-Clevite Corp.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Daven Co., The
Joe Davidson & Associates
Dejur-Amsco Corp.
Dwyer Engrg. Co., Inc.
Electromath Corp.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
Electronic Control Corp.
Electronics Corp. of America
Elektro-Serv Co.
Fairchild Controls Corp., Components Div.
General Electric Co., Apparatus Sales Div.
General Controls Co.
Hammett Electric Co.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Librascope Inc.
Markite Corp.
Perkin-Elmer Corp.
Precision Line Inc.
Reeves Instrument Corp.
Servomechanisms, Inc.
Servonic Instruments, Inc.
Spectrol Electronics Div., Carrier Corp.
Tucson Instrument Corp.

High Resistance

Ace Electronics Associates, Inc.
Anton Electronic Labs., Inc.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Dejur-Amsco Corp.
Electromath Corp.
Electro-Mec Lab. Inc.
Elektro-Serv Co.
General Controls Co.
Hammett Electric Co.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Markite Corp.
Precision Line Inc.
Servonic Instruments, Inc.
Tucson Instrument Corp.

High Voltage

Ace Electronics Associates, Inc.
Anton Electronic Labs., Inc.
Clarostat Mfg. Co., Inc.
Dejur-Amsco Corp.
Electromath Corp.
Hammett Electric Co.
Helipot Corp.
Markite Corp.
Servonic Instruments, Inc.
Tucson Instrument Corp.

Induction

American Electronics, Inc.
G. L. Collins Corp.
Diehl Mfg. Co.
Electro-Measurements Inc.
Hammett Electric Co.
Helipot Corp.
Perkin-Elmer Corp.
Reeves Instrument Corp.

Linear & Non-Linear Precision Carbon Film

Computer Instruments Corp.
F. W. Corbett Science Labs.
Dwyer Engrg. Co., Inc.
Elektro-Serv Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.

Linear & Non-Linear Precision Wire Wound

Ace Electronics Associates, Inc.
American Electronics, Inc.
Analogue Controls, Inc.
Anton Electronic Labs., Inc.
Borg Equipment Div.-The George W. Borg Corp.
Cal-Ohm Labs., Inc.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Porducts, Inc.
Joe Davidson & Associates
Daystrom Pacific Div., Daystrom Inc.
Dejur-Amsco Corp.
Electromath Corp.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
Fairchild Controls Corp., Components Div.
General Controls Co.
Hammett Electric Co.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
P. R. Mallory & Co. Inc.
Osborne Electronic Sales Corp.
Pacific Scientific Co.
Perkin-Elmer Corp.
Precision Line Inc.
Servonic Instruments, Inc.
Spectrol Electronics Div., Carrier Corp.
Topper Mfg. Co., Inc.
Tucson Instrument Corp.

Metallic Film

Chicago Telephone Supply Corp.
F. W. Corbett Science Labs.
Dale Products, Inc.
Fairchild Controls Corp., Components Div.
Hammett Electric Co.
Helipot Corp.
Gerard G. Leeds Co., Inc.
Zenith Optical Laboratory

Portable Instrument

Ace Electronics Associates, Inc.
Allegany Instrument Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
R. C. Dudek & Co.
Gray Instrument Co.
Hammett Electric Co.
Humphrey, Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Non-Linear Systems Inc.
General Electric Co., Apparatus Sales Div.
Sun Electric Corp.
Telectro Industries Corp.
Tucson Instrument Corp.

Precision

Allegany Instrument Co., Inc.
American Electronics Inc.
Analogue Controls, Inc.
Anton Electronic Labs., Inc.
Borg Equipment Div.-The George W. Borg Corp.
Clarostat Mfg. Co., Inc.
Computer Instruments Corp.
F. W. Corbett Science Labs.
Dale Products, Inc.
Joe Davidson & Associates
Daystrom Pacific Div., Daystrom Inc.
Dejur-Amsco Corp.
Electromath Corp.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
Elektro-Serv Co.
Fairchild Controls Corp., Components Div.
General Electric Co., Apparatus Sales Div.
General Controls Co.
Gray Instrument Co.
Hammett Electric Co.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Markite Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Non-Linear Systems Inc.
Osborne Electronic Sales Corp.
Precision Line Inc.
Servonic Instruments Inc.
Spectrol Electronics Div., Carrier Corp.
Tucson Instrument Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Precision Auto-Transformer

F. W. Corbett Science Labs.
R. C. Dudek & Co.
Electro-Measurements Inc.
Gertsch Products Inc.
Goslin Electric & Mfg. Co.
Hammett Electric Co.
Minco Products, Inc.
Perkin-Elmer Corp.
Saratoga Industries

Precision Carbon Film

Computer Instruments Corp.
F. W. Corbett Science Labs.
Dwyer Engrg. Co., Inc.
Elektro-Serv Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Phaostron Instrument & Electronic Co.

Printed Circuit

Ace Electronics Associates, Inc.
American Printed Circuits Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Hammett Electric Co.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
P. R. Mallory & Co. Inc.
Milmanco
Precision Line Inc.
Servonic Instruments Inc.
Zenith Optical Laboratory

Rectilinear

Ace Electronics Associates, Inc.
Analogue Controls, Inc.
Clarostat Mfg. Co., Inc.
Computer Instruments Corp.
F. W. Corbett Science Labs.
Dejur-Amsco Corp.
Edcliff Instruments
Electromath Corp.
Elektro-Serv Co.
Fairchild Controls Corp., Components Div.
General Controls Co.
Hammett Electric Co.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Markite Corp.
Minco Products, Inc.
Precision Line Inc.
Tucson Instrument Corp.

Slidewire

Aerovox Corp.
Analogue Controls, Inc.
F. W. Corbett Science Labs.
Dejur-Amsco Corp.
General Controls Co.
Hammett Electric Co.
Helipot Corp.
Micro-Wire Tungsten & Molybdenum Products
Model Rectifier Corp.
Precision Line Inc.

POWER SUPPLIES

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Amp Inc.
Acme Electric Corp.
Advance Industries, Inc.
Aerovox Corp.
Airborne Accessories Corp.
Airtron, Inc.
Alfred Electronics
Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Research & Mfg. Corp.
American Television & Radio Co.
Amplifier Corp. of America
Arnoux Corp.
Associated Research, Inc.
Autonetics, Div.-North American Aviation, Inc.
Avion Div., ACF Industries, Inc.
***BEHLMAN ENGRG. CO.**
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
J. H. Bunnell & Co.
Burroughs Corp.
Cameraflex Corp.
Collins Radio Co.
Communications Co.
Computer Engrg. Associates Inc.
Consolidated Electrodynamics Corp.
Frank R. Cook Co.
***COOPER DEVELOPMENT CORP.**
***DATA-CONTROL SYSTEMS INC.**
Joe Davidson & Associates
Del Electronics Corp.
Dunlap Electronics, Inc.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Eicor Div.-F. L. Jacobs Co.
Electric Eye Equipment Co.
Electromation Co.
Electronic Assembly Co., Inc.
Electronic Communications, Inc.
Electronic Engrg. Co. of California
Electronic Techniques, Inc.
Electronics Corp. of America
Engineered Magnetics, Div.-Gulton Industries, Inc.
Fairfield Engineering Corp.
Fansteel Metallurgical Corp.
Ferranti Electric, Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Gray Mfg. Co., The
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hammett Electric Co.
Hertner Electric Co., The
Highland Engrg. Co.
Hoover Electronics Co.
***INTERELECTRONICS CORP.**
International Research Associates
Joclin Mfg. Co.
***KAHN & CO., INC.**
Kinevox-Hallen

Kurz & Root Co.
Land Air, Inc., Sub.-California Eastern Aviation, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Magnavox Co., The
P. R. Mallory & Co., Inc.
Manson Laboratories, Inc.
Master Specialties Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
***MOTOR GENERATOR CORP.**
Motordyne, Inc.
Motoresearch Co.
Motorola Inc., Military Marketing Div.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NJE Corp.
NYT Electronics, Inc.
Neutronic Associates
North Hills Electric Co., Inc.
Opad Electric Co.
Orbitran Co., Inc.
Owen Labs., Inc.
Peschel Electronics, Inc.
George A. Philbrick Researches, Inc.
Philco Corp., Government & Industrial Divs.
Plastic Capacitors, Inc.
Potter Co., The
Power Sources, Inc.
Q. O. S. Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Saratoga Industries
Schauer Mfg. Corp.
Sel-Rex Corp.
Servomechanisms, Inc.
Southwestern Industrial Electronics Co.
Specific Products
Stromberg-Carlson, Electronics Div.
Sun Electric Corp.
Sundstrand Turbo Div., Sundstrand Machine Tool Co.
Task Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Tel-Instrument Electronics Corp.
Telkor, Inc.
Tempo Instrument, Inc.
Tensor Electric Development Co., Inc.
Trans Electronics, Inc.
Transistor Devices, Inc.
Ultradyne, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
Universal Electronics Co.
Varo Mfg. Co.
Vibration Research Labs., Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Wave Particle Corp.
***WESTINGHOUSE ELECTRIC CORP.**
Wickes Engrg. & Construction Co., Inc.
Wincharger Corp.

PRINTED CIRCUITS

***AC SPARK PLUG DIV., GENERAL MOTOR CORP.**
Advance Industries, Inc.
Airtron, Inc.
Amelco, Inc.
American Electronics, Inc., Data-Tronics Div.
American Printed Circuits Co., Inc.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Bomyte Co., The
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
Burroughs Corp.
Circon Component Corp.
Cleveland Metal Specialities Co.
Collins Radio Co.
Consolidated Electrodynamics Corp.
Dale Products, Inc.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eaton Electronics Corp.
Edgerton, Germeshausen & Grier, Inc.
Electra Lab Inc.
Electronic Associates, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Elektro-Serv Co.
Etched Products Corp.
General Components, Inc.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
B. F. Goodrich Aviation Products
Goodyear Aircraft Corp.
Haller Raymond & Brown, Inc
Hammett Electric Co.
Hansen Electronics Co.
Hoover Electronics Co.
Joclin Mfg. Co.
Keil Engrg. Products
La Pointe Industries, Inc.
Litton Industries, Components Div.
Lytle Engrg. & Mfg. Co.
Methode Mfg. Corp.
Milmanco
Motorola Inc., Military Marketing Div.
Mycalex Corp. of America
Naz-Dar Co.
Onondaga Pottery Co., Electronics Div.
Pacific Moulded Products Co.
Precision Circuits, Inc.
Printed Electronics Corp.
Radio Industries, Inc.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Rogers Corp.
Ryan Aeronautical Co.
St. Regis Paper Co.
Sanders Associates, Inc.
Skiatron Electronics & Television Corp.
Sohl Co., The
Star Engraving Co., Ltd.
Stromberg-Carlson, Electronics Div.
Superex Electronics Corp.
Sylvania Electric Products Inc., Parts Div.
Techniques, Inc.
Telectro Industries Corp.
Tri-Point Plastics Inc.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United-Carr Fastener Corp.

PROBES

Aero Research Instrument Co. Inc.
E-Z-Hook Test Products
Narda Microwave Corp., The
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Sage Laboratories, Inc.
Task Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Transvision, Inc.

Crystal

Aircom Inc.
Baird-Atomic, Inc.
Diamond Antenna & Microwave Corp.
Precision Apparatus Co., Inc.
Radiation Counter Labs., Inc.
Sage Laboratories, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Transvision, Inc.
Wacline, Inc.

High Frequency

Electro Impulse Lab., Inc.
Kay Electric Co.
Photobell Co., Inc.
Precision Apparatus Co., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Transvision, Inc.

High Voltage

Massa Labs., Inc.
Potter Co., The
Precision Apparatus Co., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Tensor Electric Development Co. Inc.
Transvision, Inc.

Measurement

Allegany Instrument Co., Inc.
Aro Equipment Corp., The
Kennametal Inc.
Precision Apparatus Co., Inc.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Tensor Electric Development Co., Inc.
Transvision, Inc.
Victory Engineering Corp.

Pitot Static

Advanced Electronics, Inc.
Aero Research Instrument Co. Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Narda Microwave Corp., The
Pioneer-Central Div., Bendix Aviation Corp.
Rosemount Engrg. Co.
Servomechanisms, Inc.
Task Corp.
Telectro Industries Corp.
Transvision, Inc.

Microwave

Aircom Inc.
Airtron, Inc.
Atco Pully Corp.
Bendix Aviation Corp., York Div.
Canoga Corp. of California
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Electro Impulse Lab., Inc.
John Gombos Co., Inc.
J-V-M Microwave Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Omega Labs., Inc.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Technical Appliance Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Transvision, Inc.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.

PULSATION CONTROL

Eagle Signal Corp.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
Motorola Inc., Military Marketing Div.
Skiatron Electronics & Television Corp.

RADAR, AIRBORNE

Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
American Printed Circuits Co., Inc.
Autonetics, Div.-North American Aviation, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Canoga Corp. of California
Collins Radio Co.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Farnsworth Electronics Co., Div.-Int'l. Telephone & Telegraph Corp.
Geisler Labs.
General Communication Co.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
Goodyear Aircraft Corp.
Gray Mfg. Co., The
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
La Pointe Industries Inc.
Lavoie Labs., Inc.
Magnavox Co., The
W. L. Maxson Corp., The
Motorola Inc., Military Marketing Div.
Pacific Div.-Bendix Aviation Corp.
Philco Corp., Government & Industrial Divs.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Stavid Engrg., Inc.
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
***WASHINGTON ALUMINUM CO., INC.**
Wave Particle Corp.
Westinghouse Electric Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

RADAR, PRECISION APPROACH

Airtron, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Ryan Aeronautical Co.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
***WASHINGTON ALUMINUM CO., INC.**
Wunderich Radio Co.

RADAR, SURVEILLANCE

Airtron, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
Canoga Corp. of California
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
Lavoie Labs., Inc.
W. L. Maxson Corp., The
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Sanders Associates, Inc.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
***TELERAD MFG. CORP.**

***WASHINGTON ALUMINUM CO., INC.**
Westinghouse Electric Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Wunderlich Radio Co.

RADIO DIRECTION FINDERS

Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Lear, Inc.
Magnavox Co., The
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
Simmonds Aerocessories, Inc.
Stromberg-Carlson, Electronics Div.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

RADIO COMPASS INDICATORS

Collins Radio Co.
Eclipse-Pioneer Div.-Bendix Aviation Corp.
General Instrument Corp., Defense Products Div.
Instruments Div.-Philips Electronics, Inc.
Magnavox Co., The
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

RADIOSONDES

American Printed Circuits Co., Inc.
***COOPER DEVELOPMENT CORP.**
General Instrument Corp., Defense Products Div.
Simmonds Aerocessories, Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Victory Engineering Corp.

RADOMES

Coleman Engrg. Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Corning Glass Works
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Diamond Antenna & Microwave Corp.
Dwyer Engrg. Co., Inc.
Electric Auto-Lite Co., The
Elektro-Serv Co.
Emerson & Cuming, Inc.
Emerson Plastics Corp.
General Instrument Corp., Defense Products Div.
Hastings Plastics Inc.
Irving Air Chute Co., Inc.
Walter Kidde & Co., Inc., Aviation Div.
McMillan Industrial Corp.
Microwave Electronics Div., Sperry Gyroscope Co.
Mycalex Corp. of America
Pacific Moulded Products Co.
Prodelin Inc.
Resdel Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Silicone Insulation, Inc.
***TELERAD MFG. CORP.**
Universal Unlimited, Inc.

RATE GYROS

***AC SPARK PLUG DIV.-GENERAL MOTOR CORP.**
Cedar Engrg. Div.-Control Data Corp.
Clary Dynamics
Eclipse-Pioneer Div., Bendix Aviation Corp.
Fairchild Controls Corp., Components Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Globe Industries, Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Humphrey, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Javelin Aircraft Co. Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Reeves Instrument Corp.
Sanders Associates, Inc.
Wave Particle Corp.
Westinghouse Electric Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Whittaker Gyro, Div.-Telecomputing Corp.

RECEIVERS

Alto Scientific Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Applied Research Inc.
Browning Laboratories, Inc.
Dwyer Engrg. Co., Inc.
Electronic Communications, Inc.
Farnsworth Electronics Co. Div.-Int'l. Telephone & Telegraph Corp.
General Communication Co.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
Nems Clarke Co., Div.-Vitro Corp. of America
Maico Electronics, Inc.
Manson Laboratories, Inc.
Marconi Instruments
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
RS Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Republic Aviation Corp., Guided Missiles Div.
Specific Products
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tensor Electric Development Co., Inc.
Transvision, Inc.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

A-M Fixed Frequency

Adler Electronics, Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Browning Laboratories, Inc.
Canoga Corp. of California
Collins Radio Co.
Communications Co.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Industrial Television Inc.
Land-Air, Inc., Sub.—California Eastern Aviation Inc.
Magnavox Co., The
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
RS Electronics Corp.
Resdel Engrg. Corp.
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

A-M & F-M Communication

Adler Electronics, Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Browning Laboratories, Inc.
Canoga Corp. of California
Collins Radio Co.
Communications Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Marconi Instruments
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
RS Electronics Corp.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

Automatic Radio Alarm

Communications Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Binaural

American Electronics, Inc.
Browning Laboratories, Inc.
Communications Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Telectro Industries Corp.
Transvision, Inc.

Communication and Amateur

Amelco, Inc.
Collins Radio Co.
Communications Co.
Magnavox Co., The
Marconi Instruments
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Varo Mfg. Co.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Direction Finding, Navigation

Advance Industries, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Lear, Inc.
Magnavox Co., The
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

Distance Measuring, Navigation

Advance Industries, Inc.
Applied Research Inc.
Bendix Aviation Corp., York Div.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Diversity

Collins Radio Co.
Communications Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Facsimile

Alden Electronic & Impulse Recording Equip. Co.
Browning Laboratories, Inc.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Hogan Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Stewart-Warner Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Fixed Frequency

Adler Electronics, Inc.
Airborne Instruments Lab., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Browning Laboratories, Inc.
Canoga Corp. of California
Collins Radio Co.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
National Electronics Laboratories Inc.
Philco Corp., Government & Industrial Divs.
RS Electronics Corp.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

F-M

Adler Electronics, Inc.
Advance Industries, Inc.
Amelco, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Blonder-Tongue Labs., Inc.
Browning Laboratories, Inc.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Marconi Instruments

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Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
RS Electronics Corp.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.

F-M Multiplex

Advance Industries, Inc.
Amelco, Inc.
Browning Laboratories, Inc.
Communications Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Frequency Shift

Amelco, Inc.
Collins Radio Co.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Glide Slope, Navigation

Bendix Radio Div.-Bendix Aviation Corp.
Canoga Corp. of California
Collins Radio Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Lear, Inc.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Transvision, Inc.
Wilcox Electric Co., Inc.

Infra-Red, Navigation

Analogue Controls, Inc.
Barnes Engineering Co.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Eastman Kodak Co.
Electronic Communications Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Industrial Television Inc.
Infrared Industries Inc.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Loran

Canoga Corp. of California
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Telectro Industries Corp.

Microwave

Advance Industries, Inc.
Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Bendix Aviation Corp., York Div.
Bendix Radio Div.-Bendix Aviation Corp.
Canoga Corp. of California
Collins Radio Co.
Demornay-Bonardi
Dwyer Engrg. Co., Inc.
Electronic Communications, Inc.
Empire Products Sales Corp.
Farnsworth Electronics Co., Div.-Int'l. Telephone & Telegraph Corp.
Geisler Labs.
General Communication Co.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Lavoie Labs., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
RS Electronics Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Stavid Engrg., Inc.
Slyvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.
Wave Particle Corp.
Wunderlich Radio Co.

Mobile

Amelco, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
*CRAIG SYSTEMS, INC.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Simmonds Aerocessories, Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Wunderlich Radio Co.

Panoramic

Amelco, Inc.
CGS Labs., Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Panoramic Radio Products, Inc.
Polarad Electronics Corp.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.

Portable & Mobile

Amelco, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Communications Co.
*CRAIG SYSTEMS, INC.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Production Research Corp.
Research & Advanced Development Div., Avco Mfg. Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Varo Mfg. Co.

Radar

Advance Industries Inc.
Airtron, Inc.
American Electronic Labs., Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Canoga Corp. of California
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Farnsworth Electronics Co., Div.-Int'l. Telephone & Telegraph Corp.
General Communication Co.
General Instrument Corp., Defense Products Div.
General Precision Lab. Inc.
General Railway Signal Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Lavoie Labs., Inc.
Magnavox Co., The
Motorola Inc., Military Marketing Div.
Pacific Div.-Bendix Aviation Corp.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
RS Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
Westinghouse Electric Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

Radiation

Barnes Engineering Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Farnsworth Electronics Co. Div.-Int'l Telephone & Telegraph Corp.
Haller Raymond & Brown Inc.
RS Electronics Corp.
Stanley Aviation Corp.
Telectro Industries Corp.

Radio Communication

Amelco, Inc.
Collins Radio Co.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Lear, Inc.
Lenkurt Electric Co., Inc.
Magnavox Co., The
Marconi Instruments
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Production Research Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV. AVCO MFG. CORP.
Simmonds Aerocessories, Inc.
Steward-Warner Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Varo Mfg. Co.
Wilcox Electric Co., Inc.
Wunderlich Radio Co.

Radio, Hand Powered Emergency

Amelco, Inc.
Frank R. Cook Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.

Radio Navigation

Amelco, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Lear, Inc.
Magnavox Co., The
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Ryan Aeronautical Co.
Simmonds Aerocessories, Inc.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Remote Pickup, Fixed

Communications Co.
Frank R. Cook Co.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

Selective Signalling, Navigation

Advance Industries, Inc.
Bell & Gossett Co.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
General Instrument Corp., Defense Products Div.
Motorola Inc., Military Marketing Div.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Varo Mfg. Co.

Short Wave, Fixed

Amelco, Inc.
Collins Radio Co.
Communications Co.
Frank R. Cook Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Resdel Engrg. Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.

Short Wave, Portable

Amelco, Inc.
Collins Radio Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Telectro Industries Corp.

Single Side Band

Adler Electronics, Inc.
Amelco, Inc.
Canoga Corp. of California
Collins Radio Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.

*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wilcox Electric Co., Inc.
Wunderlich Radio Co.

Transistor Operated

Alto Scientific Co., Inc.
Amelco, Inc.
Amercian Electronic Labs., Inc.
Canoga Corp. of California
Collins Radio Co.
Doty Acoustica Electronic Labs.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Industrial Television Inc.
International Research Associates
Magnavox Co., The
Maico Electronics, Inc.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Research & Advanced Development Div., Avco Mfg. Corp.
RS Electronics Corp.
Ryan Aeronautical Co.
Simmonds Aerocessories, Inc.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Stromberg-Carlson, Electronics Div.
Superex Electronics Corp.
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.

Uhf

Aircom Inc.
American Electronic Labs., Inc.
Applied Research Inc.
Bergen Labs.
Blonder-Tongue Labs., Inc.
Canoga Corp. of California
Collins Radio Co.
Frank R. Cook Co.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Lear, Inc.
Magnavox Co., The
Marconi Instruments
Motorola Inc., Military Marketing Div.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Simmonds Aerocessories, Inc.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Stavid Engrg., Inc.
Stromberg-Carlson Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.

Vhf

Aircom Inc.
American Electronic Labs., Inc.
Applied Research Inc.
Canoga Corp. of California
Collins Radio Co.
Frank R. Cook Co.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
International Research Associates
Lear, Inc.
Lenkurt Electric Co., Inc.
Marconi Instruments
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Simmonds Aerocessories, Inc.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Varo Mfg. Co.

Wwv

Aircom Inc.
Browning Laboratories, Inc.
Canoga Corp. of California
Haller Raymond & Brown Inc.
Lavoie Labs., Inc.
Specific Products
Telechrome Mfg. Corp.
Telectro Industries Corp.

RECEIVING EQUIPMENT, VHF OMNIRANGE

Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Lear, Inc.
Motorola Inc., Military Marketing Div.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

RECORDERS, AIRBORNE FILM

Consolidated Electrodynamics Corp.
Edgerton, Germeshausen & Grier, Inc.
General Precision Lab. Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Skiatron Electronics & Television Corp.
Specialties, Inc.
Stancil-Hoffman Corp., The
Telechrome Mfg. Corp.
Telectro Industries Corp.
Vought Co.

RECORDERS, AIRBORNE MAGNETIC

American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Autonetics, Div.-North American Aviation, Inc.
Consolidated Electrodynamics Corp.
Electromation Co.
General Precision Lab. Inc.
Gray Mfg. Co., The
Haller Raymond & Brown Inc.
Kinevox-Hallen
Minneapolis-Honeywell Regulator Co., Industrial Div.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Skiatron Electronics & Television Corp.
Stancil-Hoffman Corp., The
Telectro Industries Corp.

RECTIFIERS

Bogue Electric Mfg. Co.
Conant Laboratories
Davenport Mfg. Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
General Railway Signal Co.
Green Rectifier Co.
Hammett Electric Co.
Highland Engrg. Co.
Opad Electric Co.
Rectico, Inc.
Sel-Rex Corp.
Terminal Radio Corp.
*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.
United States Dynamics Corp.
Winder Aircraft Corp. of Fla.

Copper Oxide

Conant Laboratories
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Hammett Electric Co.
Highland Engrg. Co.
P. R. Mallory & Co., Inc.
Opad Electric Co.
Rectico, Inc.
Schauer Mfg. Corp.
Sel-Rex Corp.
Terminal Radio Corp.
*UNION SWITCH & SIGNAL, DIV-WESTINGHOUSE AIR BRAKE CORP.

Electronic Tube

Clark Electronic Laboratories
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Green Rectifier Co.
Hammett Electric Co.
Highland Engrg. Co.
Opad Electric Co.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.

Germanium

Clark Electronic Laboratories
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
Hammett Electric Co.
Sel-Rex Corp.
Terminal Radio Corp.

Mercury Arc

General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Opad Electric Co.
Rectico, Inc.
Terminal Radio Corp.

Metallic Oxide

Clark Electronic Laboratories
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Hammett Electric Co.
Opad Electric Co.
Rectico, Inc.
Sanford Miller Co.
Schauer Mfg. Corp.
Sel-Rex Corp.
Terminal Radio Corp.

Metallic, Power Supplies

Bogue Electric Mfg. Co.
Davenport Mfg. Co.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
Green Rectifier Co.
Hammett Electric Co.
Motoresearch Co.
Opad Electric Co.
Rectico, Inc.
Sanford Miller Co.
Schauer Mfg. Corp.
Sel-Rex Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

Metallic Stack

Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
Green Rectifier Co.
Hammett Electric Co.
Opad Electric Co.
Rectico, Inc.
Sarkes Tarzian, Inc.
Schauer Mfg. Corp.
Terminal Radio Corp.

Metal Sulphide

Clark Electronic Laboratories
Hammett Electric Co.
G. H. Leland, Inc.
Opad Electric Co.
Rectico, Inc.
Terminal Radio Corp.

Selenium

Bogue Electric Mfg. Co.
Clark Electronic Laboratories
Conant Laboratories
Electro-Tech Eqiupment Co.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
Green Rectifier Co.
Hammett Electric Co.
Opad Electric Co.
Rectico, Inc.
Sanford Miller Co.
Sarkes Tarzian, Inc.
Sel-Rex Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Silicon

Bogue Electric Mfg. Co.
Electro-Tech Equipment Co.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
General Nuclear Corp.
Green Rectifier Co.
Hammett Electric Co.
Hoffman Electronics Corp., Semiconductor Div.
Hughes Products, Hughes Aircraft Co., Semiconductor Div.
Motorola Semiconductor Products Div.
Opad Electric Co.
Rectico, Inc.
Sanford Miller Co.
Sarkes Tarzian, Inc.
Sel-Rex Corp.
Terminal Radio Corp.
United States Dynamics Corp.
*WESTINGHOUSE ELECTRIC CORP.

Titanium

Hammett Electric Co.
Opad Electric Co.
Sarkes Tarzian, Inc.
Terminal Radio Corp.

Tube

Clark Electronic Laboratories
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Gordos Corp.
Hammett Electric Co.
Opad Electric Co.
Penta Labs, Inc.

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Sarkes Tarzian, Inc.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**

Tube Rectifying Units

Bogue Electric Mfg. Co.
Davenport Mfg. Co.
General Electric Co., Apparatus Sales Div.
General Instrument Corp., Defense Products Div.
Green Rectifier Co.
Hammett Electric Co.
Instruments Div.-Philips Electronics, Inc.
Opad Electric Co.
Sarkes Tarzian, Inc.
Schauer Mfg. Corp.
Terminal Radio Corp.
Varo Mfg. Co.

REGULATORS, BATTERY CHARGING

Bendix Aviation Corp., Red Bank Div.
Electric Auto-Lite Co., The
Electric Regulator Corp.
General Nuclear Corp.
Green Rectifier Co.
Hammett Electric Co.
***INTERELECTRONICS CORP.**
Opad Electric Co.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Sel-Rex Corp.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

REGULATORS, FREQUENCY

American Electronics, Inc.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Electric Regulator Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Giuded Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
***INTERELECTRONICS CORP.**
Gerard G. Leeds Co., Inc.
Opad Electric Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Wacline, Inc.
Wickes Engrg. & Construction Co. Inc.
Winder Aircraft Corp. of Fla.

REGULATORS, GENERATOR

American Electronics, Inc.
Bendix Aviation Corp., Red Bank Div.
Electric Auto-Lite Co., The
Electric Regulator Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Helipot Corp.
***INTERELECTRONICS CORP.**
Kurz & Root Co.
Gerard G. Leeds Co., Inc.
Minneapolis-Honeywell Regulator Co., Ordance Div.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wickes Engrg. & Construction Co. Inc.

RELAYS

Aemco Inc.
Advanced Products Co., The
Airtron, Inc.
Alto Scientific Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Assembly Products, Inc.
Automatic Electric Sales Corp.
Automatic Switch Co.
C. P. Clare & Co.
Couch Ordnance, Inc.
Cutler-Hammer Inc.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
***HARTMAN ELECTRICAL MFG. CO., THE**
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Iron Fireman Mfg. Co., Electronics Div.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Mara Electronics, Inc.
Nemeth, Inc.
Joseph Pollak Corp.
Standard Electromagnetics, Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.

Audio Operated

Advanced Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Bell & Gossett Co.
General Electric Co., Apparatus Sales Div.
Kurman Electric Co., Div.-Norbute Corp.
Opad Electric Co.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.

Capacitance

***AMERICAN MACHINE & FOUNDRY CO.**
Photobell Co., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Coaxial

Advance Relays, Electronics Div., Elgin National Watch Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Elgin National Watch Co.
General Communication Co.
Kurman Electric Co., Div.-Norbute Corp.
Nemeth, Inc.
Joseph Pollak Corp.
Price Electric Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Thompson Products, Inc.
Transco Products, Inc.

Contact

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Cutler-Hammer Inc.
Electro Tec Corp.
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
***HARTMAN ELECTRICAL MFG. CO., THE**
Hillburn Electronic Prods. Co.
Hi-Spec Electronics Corp.
Jaidinger Mfg. Co., Inc.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Nemeth, Inc.
Price Electric Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Stevens-Arnold Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Vap-Air Div., Vapor Heating Corp.

Cross-Bar

***AMERICAN MACHINE & FOUNDRY CO.**
Advance Relays, Electronics Div.-Elgin National Watch Co.
James Cunningham Son & Co., Inc.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Hillburn Electronic Prods. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
North Electric Co.
RBM Div.-Essex Wire Corp.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

D Arsonval

***AMERICAN MACHINE & FOUNDRY CO.**
Assembly Products, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Nemeth, Inc.
Simpson Electric Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Differential

Abrams Instrument Corp.
Advance Relays, Electronics Div., Elgin National Watch Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Automatic Switch Co.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro-Mechanical Specialties Co., Inc.
Filtors, Inc.
General Automatic Corp.
General Electric Co., Apparatus Sales Div.
***HARTMAN ELECTRICAL MFG. CO., THE**
Kurman Electric Co., Div.-Norbute Corp.
Mara Electronics, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Joseph Pollak Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Electronic, Resistance Activated

***AMERICAN MACHINE & FOUNDRY CO.**
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Comar Electric Co.
Cutler-Hammer Inc.
Electro-Mechanical Specialties Co., Inc.
Electron-Radar Products
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
M F Electronics Co.
Nemeth, Inc.
North Electric Co.
Opad Electric Co.
Peschel Electronics, Inc.
RBM Div.-Essex Wire Corp.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Victory Engineering Corp.

Frequency Selective

Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Switch Co.
James G. Biddle Co.
General Automatic Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
***HARTMAN ELECTRICAL MFG. CO., THE**
Jaidinger Mfg. Co., Inc.
Leach Corp.
Stevens-Arnold Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

High Voltage

Aemco Inc.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Cutler-Hammer Inc.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
Filtors, Inc.
Jennings Radio Mfg. Corp.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Mara Electronics, Inc.
Opad Electric Co.
Peschel Electronics, Inc.
Joseph Pollak Corp.
Potter & Brumfield Inc.
RBM Div.-Essex Wire Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Vap-Air Div., Vapor Heating Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Impulse

***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Comar Electric Co.
Elgin National Watch Co.
Filtors, Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hillburn Electronic Prods. Co.
Kurman Electric Co., Div.-Norbute Corp.
Mara Electronics, Inc.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
***UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.**
***WESTINGHOUSE ELECTRIC CORP.**

Keying and Break-In

Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**

Automatic Electric Sales Corp.
C. P. Clare & Co.
Comar Electric Co.
Elgin National Watch Co.
Hillburn Electronic Prods. Co.
E. F. Johnson Co.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Mara Electronics, Inc.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Relay Sales Inc.
Sigma Instruments, Inc.
Simpson Electric Co.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Time Delay

Abrams Instrument Corp.
Advanced Products Co., The
Alto Scientific Co., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Amglo Corp.
Auotmatic Electric Sales Corp.
Automatic Switch Co.
Baso Inc.
Blonder-Tongue Labs., Inc.
C. P. Clare & Co.
Comar Electric Co.
James Cunningham Son & Co., Inc.
Cutler-Hammer Inc.
Joe Davidson & Associates
Dunlap Electronics, Inc.
Thomas A. Edison Ind., Instrument Div.—Mc-Graw-Edison Co.
Electro-Mechanical Specialties Co., Inc.
Electron-Radar Products
Electronic Techniques, Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
G-V Controls Inc.
General Automatic Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Globe Industries, Inc.
*A. W. HAYDON CO., THE
Haydon Div.-General Time Corp.
Hillburn Electronic Prods. Co.
Iron Fireman Mfg. Co., Electronics Div.
Jordan Electronics, Div.-Victoreen Instrument Co.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
Master Specialties Co.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
North Electric Co.
George Ulanet Co.
Price Electric Corp.
Raymond Engrg. Laboratory, Inc.
Relay Sales Inc.
Simpson Electric Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
Tempo Instrument Inc.
Terminal Radio Corp.
Thompson Products, Inc.
Vemaline Products Co.
Waugh Engrg. Co.
*WESTINGHOUSE ELECTRIC CORP.
G. C. Wilson & Co.

Timing

Abrams Instrument Corp.
Advance Relays, Electronics Div., Elgin National Watch Co.
Advanced Products Co., The
*AMERICAN MACHINE & FOUNDRY CO.
Amglo Corp.
Cutler-Hammer Inc.
M. Ducommun Co.
Electronic Techniques, Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
*A. W. HAYDON CO., THE
Haydon Div.-General Time Corp.
Jordan Electronics, Div.-Victoreen Instrument Co.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Nemeth, Inc.
Price Electric Corp.
Relay Sales Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
Tempo Instrument Inc.
Terminal Radio Corp.
Vemaline Products Co.
*WESTINGHOUSE ELECTRIC CORP.
G. C. Wilson & Co.

Under Frequency

*AMERICAN MACHINE & FOUNDRY CO.
Cutler-Hammer Inc.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
*HARTMAN ELECTRICAL MFG. CO., THE
Jordan Electronics, Div.-Victoreen Instrument Co.
Leach Corp.
Livingston Electronic Corp.
Lumen, Inc.
Opad Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.

Vacuum Contact

*AMERICAN MACHINE & FOUNDRY CO.
C. P. Clare & Co.
Gordos Corp.
Jennings Radio Mfg. Corp.
Livingston Electronic Corp.
Penta Labs., Inc.
Philadelphia Scientific Glass Co.
Relay Sales Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Vibrating Reed Type

*AMERICAN MACHINE & FOUNDRY CO.
American Television & Radio Co.
Amglo Corp.
Automatic Electric Sales Corp.
Bell & Gossett Co.
James G. Biddle Co.
Cutler-Hammer Inc.
Gordos Corp.
Iron Fireman Mfg. Co., Electronics Div.
Jaidinger Mfg. Co., Inc.
Livingston Electronic Corp.
North Electric Co.
Stevens-Arnold Inc.
Telectro Industries Corp.
Telkor, Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Latching

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Allard Instrument Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
Automatic Switch Co.
C. P. Clare & Co.
Cutler-Hammer Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
General Automatic Corp.
Guardian Electric Mfg. Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Hillburn Electronic Prods. Co.
Jaidinger Mfg. Co., Inc.
Jennings Radio Mfg. Corp.
Leach Corp.
Livingston Electronic Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
North Electric Co.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Sigma Instruments, Inc.
Simpson Electric Co.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Mercury

*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
C. P. Clare & Co.
Electron-Radar Products
Electro-Tech Equipment Co.
Gordos Corp.
Livingston Electronic Corp.
Mercury Contacts, Inc.
Philadelphia Scientific Glass Co.
Relay Sales Inc.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Meter

*AMERICAN MACHINE & FOUNDRY CO.
Beede Electrical Instrument Co. Inc.
Thomas A. Edison Ind., Instrument Div.—Mc-Graw-Edison Co.
Electro-Tech Equipment Co.
Livingston Electronic Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Microwave

Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Demornay-Bonardi
Electron-Radar Products
Engelhard Industries Inc., D. E. Makepeace Div.
Geisler Labs.
J-V-M Microwave Co.
Livingston Electronic Corp.
Microwave Development Labs., Inc.
Prodelin Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Thompson Products, Inc.
Uniwave, Inc.
Wave Particle Corp.

Overfrequency

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., Red Bank Div.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
G-V Controls Inc.
General Electric Co., Apparatus Sales Div.
*HARTMAN ELECTRICAL MFG. CO., THE
Jordan Electronics, Div.-Victoreen Instrument Co.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Opad Electric Co.
Terminal Radio Corp.
Varo Mfg. Co.

Overload

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer Inc.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
G-V Controls Inc.
General Automatic Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Hillburn Electronic Prods. Co.
Jaidinger Mfg. Co., Inc.
Jennings Radio Mfg. Corp.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Magnecraft Electric Co.
Metals & Controls Corp.
North Electric Co.
Opad Electric Co.
Price Electric Corp.
RBM Div.-Essex Wire Corp.
Relay Sales Inc.
Tempo Instrument Inc.
Terminal Radio Corp.

Overvoltage & Undervoltage

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Automatc Switch Co.
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer Inc.
Dunlap Electronics, Inc.
Thomas A. Edison Ind., Instrument Div.—Mc-Graw-Edison Co.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
Filtors, Inc.
G-V Controls Inc.
General Automatic Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Jordan Electronics, Div.-Victoreen Instrument Co.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Lumen, Inc.
Magnecraft Electric Co.
North Electric Co.
Opad Electric Co.
Joseph Pollak Corp.
Price Electric Corp.
Tempo Instrument Inc.
Terminal Radio Corp.
Waugh Engrg. Co.

Photoelectric

*AMERICAN MACHINE & FOUNDRY CO.
Autotron, Inc.
C. P. Clare & Co.
Thomas A. Edison Ind., Instrument Div.—Mc-Graw-Edison Co.
Electron-Radar Products
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hi-Spec Electronics Corp.
Kurman Electric Co., Div.-Norbute Corp.
Livingston Electronic Corp.
Nemeth, Inc.
Opad Electric Co.
Optomechanisms Inc.
Photobell Co., Inc.
Robot Appliances Inc.
Sigma Instruments, Inc.
Standard Electromagnetics, Inc.
Terminal Radio Corp.

Plate Circuit

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
Brubaker Elctronics, Inc., Sub.—Telecomputing Corp.
C. P. Clare & Co.
Comar Electric Co.
Couch Ordnance, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro-Mechanical Specialties Co., Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
General Automatic Corp.
Guardian Electric Mfg. Co.
Hillburn Electronic Prods. Co.
Hi-Spec Electronics Corp.
Iron Fireman Mfg. Co., Electronics Div.
Jaidinger Mfg. Co., Inc.
Jennings Radio Mfg. Corp.
Kurman Electric Co., Div.-Norbute Corp.
Livingston Electronic Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Sohl Co., The
Standard Electromagnetics, Inc.
Terado Co.
Terminal Radio Corp.
*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.

Polarized

*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
Barber-Colman Co.
Bendix Aviation Corp., Red Bank Div.
C. P. Clare & Co.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Elgin National Watch Co.
General Railway Signal Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Magnetic Devices, Inc.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Relay Sales Inc.
Sigma Instruments, Inc.
Stevens-Arnold Inc.
Terminal Radio Corp.

Power

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
*WESTINGHOUSE ELECTRIC CORP.
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer inc.
Electro-Mechanical Specialties Co., Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Hillburn Electronic Prods. Co.
Hi-Spec Electronics Corp.
Jennings Radio Mfg. Corp.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Philadelphia Scientific Glass Co.
Joseph Pollak Corp.
Potter & Brumfield Inc.
Price Electric Corp.
RBM Div.-Essex Wire Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Terminal Radio Corp.
Vap-Air Div., Vapor Heating Corp.
*WESTINGHOUSE ELECTRIC CORP.

Reverse Current

*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Leach Corp.
Livingston Electronic Corp.
Mara Electronics, Inc.
Master Specialties Co.
Terminal Radio Corp.

R-F

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Geisler Labs.
Gordos Corp.
Hillburn Electronic Prods. Co.
J-V-M Microwave Co.
Jennings Radio Mfg. Corp.
E. F. Johnson Co.
Kurman Electric Co., Div.-Norbute Corp.
Livingston Electronic Corp.
Mara Electronics, Inc.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
Price Electric Corp.
Relay Sales Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Wave Particle Corp.

Rotary

Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Couch Ordnance, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro-Mechanical Specialties Co., Inc.
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Exact Engrg. & Mfg. Inc.
Filtors, Inc.
Globe Industries, Inc.
Guardian Electric Mfg. Co.
Hi-G, Inc.
Jaidinger Mfg. Co., Inc.
G. H. Leland, Inc.
Livingston Electronic Corp.
Magnecraft Electric Co.
Magnetic Devices, Inc.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
North Electric Co.
Price Electric Corp.
Relay Sales Inc.
Terminal Radio Corp.
*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.

Sensitive

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Aerolite Electronics Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Assembly Products, Inc.
Automatic Electric Sales Corp.
Automatic Switch Co.
Baso Inc.
Comar Electric Co.
Couch Ordnance, Inc.
Cutler-Hammer Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
General Automatic Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Hillburn Electronic Prods. Co.
Hi-Spec Electronics Corp.
Iron Fireman Mfg. Co., Electronics Div.
Jaidinger Mfg. Co., Inc.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Lumen, Inc.
Magnecraft Electric Co.
Magnetic Devices, Inc.
Mara Electronics, Inc.
Nemeth, Inc.
North Electric Co.
Phaostron Instrument & Electronic Co.
Philadelphia Scientific Glass Co.
Joseph Pollak Corp.
Potter & Brumfield Inc.
Price Electric Corp.
RBM Div.-Essex Wire Corp.
Relay Sales Inc.
*SCHWEBER ELECTRONICS
Sigma Instruments, Inc.
Standard Electromagnetics, Inc.
Tempo Instrument Inc.
Terado Co.
Terminal Radio Corp.
*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.
Victory Engineering Corp.

Sequence

Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Auotmatic Electric Sales Corp.
Cutler-Hammer Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
Guardian Electric Mfg. Co.
Hamilton Watch Co., Military Products Div.
*A. W. HAYDON CO., THE
Leach Corp.
Livingston Electronic Corp.
Mara Electronics, Inc.
Master Specialties Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Nemeth, Inc.
North Electric Co.
Relay Sales Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Stepping

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
Bergen Labs.
C. P. Clare & Co.
Cutler-Hammer Inc.
Elgin National Watch Co.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hamilton Watch Co., Military Products Div.
*A. W. HAYDEN CO. THE
Leach Corp.
G. H. Leland, Inc.
Livingston Electronic Corp.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Subminiature

Aemco Inc.
Ace Electronics Associates, Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Baso Inc.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
C. P. Clare & Co.
Comar Electric Co.
Couch Ordnance, Inc.
Electro Tec Corp.
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Filtors, Inc.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hi-G, Inc.
Iron Fireman Mfg. Co.. Electronics Div.
Jaidinger Mfg. Co., Inc.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
E. V. Naybor Labs., Inc.
North Electric Co.
Phaostron Instrument & Electronic Co.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
*SCHWEBER ELECTRONICS
Simpson Electric Co.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Tempo Instrument Inc.
Terado Co.

Terminal Radio Corp.
*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.
Victory Engineering Corp.

Synchronizing, Transfer

*HARTMAN ELECTRICAL MFG. CO., THE

Telephone

American Brass Co., The
*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
C. P. Clare & Co.
Comar Electric Co.
Electro-Mechanical Specialties Co., Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
G-V Controls Inc.
General Automatic Corp.
Guardian Electric Mfg. Co.
Hillburn Electronic Prods. Co.
Kurman Electric Co., Div.-Norbute Corp.
Leach Corp.
Livingston Electronic Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
Nemeth, Inc.
North Electric Co.
Joseph Pollak Corp.
Potter & Brumfield Inc.
Price Electric Corp.
RBM Div.-Essex Wire Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Terminal Radio Corp.

Temperature Compensated

*AMERICAN MACHINE & FOUNDRY CO.
Assembly Products, Inc.
Automatic Electric Sales Corp.
Baso Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Elgin National Watch Co.
G-V Controls Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
*HARTMAN ELECTRICAL MFG. CO., THE
E. Vernon Hill & Co.
Leach Corp.
Livingston Electronic Corp.
Joseph Pollak Corp.
Sigma Instruments, Inc.
Terminal Radio Corp.

Thermal

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Blonder-Tongue Labs., Inc.
Cutler-Hammer Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electron-Radar Products
Elgin National Watch Co.
G-V Controls Inc.
General Automatic Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Leach Corp.
Livingston Electronic Corp.
Relay Sales Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Vap-Air Div., Vapor Heating Corp.
Victory Engineering Corp.

Thermostatic Delay

*AMERICAN MACHINE & FOUNDRY CO.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electron-Radar Products
Iron Fireman Mfg. Co., Electronics Div.
George Ulanet Co.
Relay Sales Inc.
Telectro Industries Corp.
Vap-Air Div., Vapor Heating Corp.

REMOTE PICKUP, AUDIO

Magnasync Mfg. Co., Ltd.
Motorola Inc., Military Marketing Div.
Telectro Industries Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

REPEATERS, MICROWAVE

Geisler Labs.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Wave Particle Corp.

REPEATERS, PASSIVE, MICROWAVE

Ainslie Corp.
Demornay-Bonardi
Gabriel Co., The Gabriel Electronics Div.
Geisler Labs.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Prodelin Inc.
Telectro Industries Corp.
Uniwave, Inc.
Wave Particle Corp.

RESISTANCE THERMOMETER BULBS

Cardinal Instrumentation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Minco Products, Inc.
United Control Corp.

RESISTORS

Allied Plastic Supply Corp.
Atlas Resistor Co.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
General Railway Signal Co.
Globar Plant, Refractories Div.-The Carborundum Co.
Gray Instrument Co.
Leeds & Northrup Co.
Mepco Inc.
Ohio Carbon Co., The
Phaostron Instrument & Electronic Co.
Precision Resistor Co. Inc.
Terminal Radio Corp.

Boroncarbon

Aerovox Corp.
Key Resistor Corp.
Mepco Inc.
Terminal Radio Corp.

Carbon Film

Aerovox Corp.
Cal-Ohm Labs., Inc.
Clarostat Mfg. Co., Inc.
Computer Instruments Corp.
Continental Carbon, Div.-Wirt Co.
Dale Products, Inc.
Electra Mfg. Co.
Erie Resistor Corp.
Key Resistor Corp.
Mepco Inc.
Phaostron Instrument & Electronic Co.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

Decade

Aerovox Corp.
Dale Products, Inc.
Dmeter Mfg. Co., Inc.
Electro-Measurements, Inc.
Fidelity Amplifier Co.
Industrial Instruments Inc.
Key Resistor Corp.
Mepco Inc.
Pacific Resistor Co.
Precision Resistor Co. Inc.
Terminal Radio Corp.

Deposited Carbon

Aerovox Corp.
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
Dale Products, Inc.
Electra Mfg. Co.
Erie Resistor Corp.
Key Resistor Corp.
P. R. Mallory & Co. Inc.
Mepco Inc.
Morganite, Inc.
Phaostron Instrument & Electronic Co.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

Encapsulated

Axel Electronics
Cal-Ohm Labs., Inc.
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
F. W. Corbett Science Labs.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Electra Mfg. Co.
Gordos Corp.
Key Resistor Corp.
Mepco Inc.
Pacific Resistor Co.
Precision, Inc.
Precision Resistor Co. Inc.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.
Transformers, Inc.

Film

Aerovox Corp.
Allied Plastics Supply Corp.
Cal-Ohm Labs., Inc.
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
Corning Glass Works
Dale Products, Inc.
Electra Mfg. Co.
Erie Resistor Corp.
Filmohm Corp.
Key Resistor Corp.
Mepco Inc.
Metavac, Inc.
Terminal Radio Corp.

Fixed Wire-Wound

Axel Electronics
Bradford Components, Inc.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
F. W. Corbett Science Labs.
Dale Products, Inc.
Dmeter Mfg. Co., Inc.
Electro-Flex Heat, Inc.
Electromath Corp.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
Fugle-Miller Labs Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Gray Instrument Co.
P. R. Mallory & Co. Inc.
Mepco Inc.
Non-Linear Systems Inc.
Ohio Carbon Co., The
Pacific Resistor Co.
Precision, Inc.
Precision Resistor Co. Inc.
Sage Electronics Corp.
Tel-Labs., Inc.
Tepro Electric Co.
Terminal Radio Corp.
Transformers, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Fuse

Bradford Components, Inc.
Clarostat Mfg. Co., Inc.
Mepco Inc.
Ohio Carbon Co., The
Terminal Radio Corp.

Glass

Corning Glass Works
Filmohm Corp.
Key Resistor Corp.
Mepco Inc.
Metavac, Inc.
Morganite, Inc.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

High Frequency

Allied Plastics Supply Corp.
Corning Glass Works
Dale Products, Inc.
Electra Mfg. Co.
Electro Impulse Lab., Inc.
Electromath Corp.
Filmohm Corp.
Globar Plant, Refractories Div.-The Carborundum Co.
Hansen Electronics Co.
Key Resistor Corp.
Mepco Inc.
Ohio Carbon Co., The
Terminal Radio Corp.

High Temperature

Abrams Instrument Corp.
Allied Plastics Supply Corp.
Carbone Corp., The
Corning Glass Works
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Electra Mfg. Co.,
Electromath Corp.
Globar Plant, Refractories Div.-The Carborundum Co.
Humphrey, Inc.
Key Resistor Corp.
Mepco Inc.
Metavac, Inc.
Pacific Resistor Co.
Pyrofilm Resistor Co., Inc.
Sage Electronics Corp.
Tepro Electric Co.
Terminal Radio Corp.

High Voltage

Allied Plastics Supply Corp.
Dale Products, Inc.
Electromath Corp.
Erie Resistor Corp.
Mepco Inc.

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Morganite, Inc.
Ohio Carbon Co., The
Precision Resistor Co. Inc.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Miniature Variable

Chicago Telephone Supply Corp.
Clark Electronic Laboratories
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
Dale Products, Inc.
Electromath Corp.
Electro-Mech Lab. Inc.
General Controls Co.
P. R. Mallory & Co. Inc.
Precision Line Inc.
Spectrol Electronics Div., Carrier Corp.
Terminal Radio Corp.

Photo Sensitive

Eastman Kodak Co.
Terminal Radio Corp.

Plug-In-Tube

Cal-Ohm Labs., Inc.
Key Resistor Corp.
Mepco Inc.
Terminal Radio Corp.

Precision

Aerovox Corp.
Atlas Resistor Co.
Axel Electronics
Bradford Components, Inc.
Carbone Corp., The
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
F. W. Corbett Science Labs.
Corning Glass Works
Dale Products, Inc.
Dmeter Mfg. Co., Inc.
Dwyer Engrg. Co., Inc.
Electra Mfg. Co.
Electromath Corp.
Electro-Measurements Inc.
Electro-Mech Lab. Inc.
Filmohm Corp.
Gray Instrument Co.
Humphrey, Inc.
Leeds & Northrup Co.
Mepco Inc.
Metavac, Inc.
Miller Electro-Research Labs.
Non-Linear Systems Inc.
Pacific Resistor Co.
Precision, Inc.
Sage Electronics Corp.
Spectrol Electronics Div., Carrier Corp.
Tepro Electric Co.
Terminal Radio Corp.
Transformers, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Printed Circuit

Aerovox Corp.
Allied Plastics Supply Corp.
Continental Carbon, Div.-Wirt Co.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Filmohm Corp.
Hansen Electronics Co.
P. R. Mallory & Co. Inc.
Mepco Inc.
Milmanco
Naz-Dar Co.
Non-Linear Systems Inc.
Onondaga Pottery Co., Electronics Div.
Terminal Radio Corp.
United-Carr Fastener Corp.

RECTILINEAR

Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Electromath Corp.
General Controls Co.
Hansen Electronics Co.
Mepco Inc.
Precision Line Inc.
Terminal Radio Corp.

Silicone

F. W. Corbett Science Labs.
Dale Products, Inc.
Filmohm Corp.
Globar Plant, Refractories Div.-The Carborundum Co.
Key Resistor Corp.
Mepco Inc.
Morganite, Inc.
Pacific Resistor Co.
Sage Electronics Corp.
Tepro Electric Co.
Terminal Radio Corp.

Subminiature

Cal-Ohm Labs., Inc.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Electra Mfg. Co.
Electromath Corp.
Globar Plant, Refractories Div.-The Carbonundum Co.
Hansen Electronics Co.
Humphrey, Inc.
Mepco Inc.
Pacific Resistor Co.
Precision, Inc.
Sage Electronics Corp.
Tepro Electric Co.
Terminal Radio Corp.

Temperature Sensitive

Allied Plastics Supply Corp.
Axel Electronics
Cal-Ohm Labs., Inc.
Carbone Corp., The
Green Rectifier Co.
Metavac, Inc.
Precision, Inc.
Terminal Radio Corp.
Victory Engineering Corp.

Tape

Allied Plastics Supply Corp.
Dwyer Engrg. Co., Inc.
Hansen Electronics Co.
Terminal Radio Corp.

Variable Composition

Ace Electronics Associates, Inc.
Chicago Telephone Supply Corp.
Clark Electronic Laboratories
Clarostat Mfg. Co., Inc.
Terminal Radio Corp.

Variable, Miniature

Ace Electronics Associates, Inc.
Aerovox Corp.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Edcliff Instruments
Electromath Corp.
General Controls Co.
Humphrey, Inc.
Key Resistor Corp.
P. R. Mallory & Co. Inc.
Mepco Inc.
Pacific Resistor Co.
Precision Line Inc.
Spectro Eectronics Div., Carrier Corp.
Terminal Radio Corp.

Wire Wound

Ace Electronics Associates, Inc.
Atlas Resistor Co.
Axel Electronics
Bradford Components, Inc.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
F. W. Corbett Science Labs.
Dale Products, Inc.
Dmeter Mfg. Co., Inc.
Electro-Flex Heat, Inc.
Electromath Corp.
Electro-Measurements Inc.
Eectro-Mec Lab. Inc.
Fugle-Miller Labs Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Gray Instrument Co.
Humphrey, Inc.
P. R. Mallory & Co. Inc.
Mepco Inc.
Ohio Carbon Co., The
Pacific Resistor Co.
Precision, Inc.
Precision Line Inc.
Sage Electronics Corp.
Spectrol Electronics Div., Carrier Corp.
Tepro Electric Co.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

RESOLVERS

American Electronics, Inc.
Burroughs Corp.
Cedar Engrg. Div.-Control Data Corp.
Computer Instruments Corp.
Diehl Mfg. Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Helipot Corp.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub. Standard Coil Products Co. Inc.
Lear, Inc., Grand Rapids Div.
Reeves Instrument Corp.
Terminal Radio Corp.

RHEOSTATS

Analogue Controls, Inc.
Anton Electronic Labs., Inc.
James G. Biddle Co.
Cedar Engrg. Div.-Control Data Corp.
Clarostat Mfg. Co., Inc.
Continental Carbon, Div.-Wirt Co.
Cutler-Hammer Inc.
Dejur-Amsco Corp.
Electro-Measurements Inc.
Electro-Tech Equipment Co.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Grimes Mfg. Co.
Hammett Electric Co.
P. R. Mallory & Co. Inc.
Superior Electric Co., The
Tucson Instrument Corp.
Vinson Mfg. Co. Inc.

SERVO MECHANISM CONTROL SYSTEMS

Airtron, Inc.
Acoustica Associates, Inc.
Acromag Inc.
Advance Industries, Inc.
Aeroflex Corp., The, Aeroflex Labs. Div.
Aircraft Armaments, Inc.
All American Aircraft Products, Inc.
Amelco, Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
*AMERICAN MACHINE & FOUNDRY CO.
American Research & Mfg. Corp.
Analogue Controls, Inc.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Autonetics, Div.-North American Aviation, Inc.
Barber-Colman Co.
Bogue Electric Mfg. Co.
Bowmar Instrument Corp.
Burroughs Corp.
CDC Control Services, Inc.
Cadillac Gage Co.
Consolidated Controls Corp.
Frank R. Cook Co.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
*EASTERN INDUSTRIES, INC.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
*ELECTROL INC.
Electro-Mec Lab. Inc.
Electronic Associates, Inc.
Exact Engrg. & Mfg. Inc.
Feedback Controls, Inc.
Ford Instrument Co., Div.-Sperry Rand Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Controls Co.
General Precision Lab, Inc.
Goodyear Aircraft Corp.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hallamore Electronics Co.
Hydra-Power Corp.
Industrial Control Co.
North Atlantic Industries, Inc.
Javelin Aircraft Co. Inc.
Kearfott Co., Inc.
Kelsey-Hayes Co.
Walter Kidde & Co., Inc., Aviation Div.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Lear, Inc.
Lear, Inc., Grand Rapids Div.
Librascope Inc.
Link Aviation, Inc.
J. A. Maurer, Inc.
Mechanical Div.-General Mills, Inc.
Mercury International Industries Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Parameters, Inc.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Servo Corp. of America
Servomechanisms, Inc.
Southwestern Industrial Electronics Co.
Southwestern Industries, Inc.
Spectrol Electronics Div., Carrier Corp.
Stavid Engrg., Inc.

Sundstrandt Aviation, Div.-Sundstrand Machine Tool Co.
Talley Corp., The
Telectro Industries Corp.
Teleflex Inc.
M. Ten Bosch, Inc.
Topper Mfg. Co., Inc.
United Control Corp.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
Wacline, Inc.
Weighing & Control Components, Inc.
Weston Hydraulics, Ltd.

SERVOS, MEASUREMENT

Advance Industries, Inc.
Analogue Controls, Inc.
Brush Instruments, Div.-Clevite Corp.
CDC Control Services, Inc.
Datran Electronics, Div.-Mid-Continent Mfg., Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Exact Engrg. & Mfg. Inc.
General Controls Co.
North Atlantic Industries, Inc.
Kearfott Co., Inc.
Kelsey-Hayes Co.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Telectro Industries Corp.
Theta Instrument Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Control Corp.
Weighing & Control Components, Inc.

SHEETS, METAL CLAD, PRINTED CIRCUIT

Allied Plastics Supply Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dwyer Engrg. Co., Inc.
B. F. Goodrich Aviation Products
La Pointe Industries Inc.
Magnetic Shield Div.-Perfection Mica Co.
New England Laminates Co., Inc.
St. Regis Paper Co.
Techniques, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America

SHIELDING, COIL

Emerson Plastics Corp.
Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Silicone Insulation, Inc.

SHIELDING, ELECTROSTATIC

American Brass Co., The
Auburn Mfg. Co., The
Belden Mfg. Co.
General Cable Corp.
Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Merix Chemical Co.
Newark Wire Cloth Co.
Tensor Electric Development Co., Inc.

SHIELDING, TRANSFORMER

Emerson Plastics Corp.
Kling Metal Spinning & Stamping Co.
Magnetic Shield Div.-Perfection Mica Co.
Silicone Insulation, Inc.
Swedlow Plastics Co.
Tensor Electric Development Co., Inc.
United Transformer Corp.

SHIELDING, TUBE

Allied Plastics Supply Corp.
American Brass Co., The
Atlas E-E Corp.
Beaton & Corbin Mfg. Co., The
Belden Mfg. Co.
Connector Corp.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
Kling Metal Spinning & Stamping Co.
Livingston Electronic Corp.
Magnetic Shield Div.-Perfection Mica Co.
Methode Mfg. Corp.

SHUNTS, METER

Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Narda Microwave Corp., The
Minneapolis-Honeywell Regulator Co., Industrial Div.
Sun Electric Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

SHUTTERS, MICROWAVE

Canoga Corp. of California
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Goodyear Aircraft Corp.
Omega Labs., Inc.
Ryan Aeronautical Co.
***TELERAD MFG. CORP.**
Waveline, Inc.

SLIDING LOADS, MICROWAVE

Bogart Mfg. Corp.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Douglas Microwave Co., Inc.
J-V-M Microwave Co.
Omega Labs., Inc.
Sage Laboratories, Inc.

SOLDER, PRINTED CIRCUIT

Accurate Specialties Co. Inc.
Alpha Metals, Inc.
Anchor Metal Co. Inc.
Bow Solder Products Co., Inc.
Johnson Mfg. Co., Inc.
La Pointe Industries Inc.

SOLDER, SILVER

Accurate Specialties Co. Inc.
All-State Welding Alloys Co., Inc.
American Brazing Alloys Co.
American Silver Co.
Anchor Metal Co. Inc.
Attleboro Refining Co. Inc.
Dalweld Co. Inc.
Eastern Smelting & Refining Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Goldsmith Brothers Smelting & Refining Co.
Handy & Harman
Walter K. Jaros, Aircrafters
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
J. M. Ney Co., The
Standard Metals Corp.
Tricon Mfg. Co.

SOLDER, RINGS AND PREFORMS

Accurate Specialties Co. Inc.
All-State Welding Alloys Co., Inc.
American Brazing Alloys Co.
American Silver Co.
Anchor Metal Co. Inc.
Art Wire & Stamping Co.
W. L. Barrett Co., The
Dalweld Co. Inc.
Division Lead Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Gasket, Packing & Specialty Co., Inc.
General Findings & Supply Co., Industrial Div
Handy & Harman
Johnson Mfg. Co., Inc.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
Standard Metals Corp.
Tricon Mfg. Co.
Western Gold & Platinum

SOLENOID VALVES

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Automatic Switch Co.
Clary Dynamics
Conax Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Tech Equipment Co.
Futurecraft Corp.
General Controls Co.
Gray & Huleguard, Inc.
Walter J. Hyatt Co., The
Hydra-Power Corp.
Johnson Electronics Inc.
***KOONTZ-WAGNER ELECTRIC CO., INC.**
Gerard G. Leeds Co., Inc.
Lyndon Aircraft, Inc.
Mar Vista Engrg. Co.
Jas. P. Marsh Corp.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Pacific Div.-Bendix Aviation Corp.
Parker Aircraft Co.
Pneu-Hydro Valve Corp.
Skinner Electric Valve Div., The Skinner Chuck Co.
Tactair Valve Div.-Aircraft Products Co.
Talley Corp., The
***UNITED AIRCRAFT PRODUCTS, INC.**
***VALCOR ENGRG. CORP.**
Vickers Inc., Div.-Sperry Rand
Weston Hydraulics, Ltd.

SOLENOIDS

A.P.W. Co.
Advanced Electronics, Inc.
Aerolite Electronics Corp.
Automatic Switch Co.
Cannon Electric Co.
Clary Dynamics
Comar Electric Co.
Cutler-Hammer Inc.
Electrical Windings, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Engelberg Huller Co., Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hillburn Electronic Prods. Co.
Walter J. Hyatt Co., The
Johnson Electronics Inc.
***KOONTZ-WAGNER ELECTRIC CO., INC.**
Leetronics, Inc.
G. H. Leland, Inc.
Mar Vista Engrg. Co.
Mara Electronics, Inc.
J. A. Maurer, Inc.
Nemeth, Inc.
Parker Aircraft Co.
Pickering & Co., Inc.
Precision, Inc.
Relay Sales Inc.
Telectro Industries Corp.
Tri-Dex Co.
Wacline, Inc.
Western Coil Products Co.
Weston Hydraulics, Ltd.
Wunderlich Radio Co.

SONAR

Acoustica Associates, Inc.
Analogue Controls, Inc.
Dwyer Engrg. Co., Inc.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
La Pointe Industries Inc.
Librascope Inc.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
***WESTINGHOUSE ELECTRIC CORP.**

SQUIBS

American Rocket Co.
Librascope Inc.
McCormick Selph Associates
Propellex Chemical Corp.
Raymond Engrg. Laboratory, Inc.
Turbo Dynamics Corp.
Winchester-West. Div.-Olin Mathieson Chem. Corp.

STANDARDS

Allegany Instrument Co., Inc.
Barnes Development Co.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
Leeds & Northrup Co.
Marconi Instruments
Specific Products
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

Capacitance

Barnes Development Co.
Boonton Electronics Corp.
Consolidated Airborne Systems, Inc.
Leeds & Northrup Co.
Simmonds Areocessories, Inc.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Frequency

James G. Biddle Co.
Demornay-Bonardi
Dunlap Electronics, Inc.
Gertsch Products Inc.
Hycon Eastern Inc.
Marconi Instruments
August E. Miller Laboratories
Ernst Norrman Laboratories
Specific Products
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

Inductance

Leeds & Northrup Co.
United Transformer Corp.
Winder Aircraft Corp. of Fla.

Laboratory Time

Allegany Instrument Co., Inc.
Dunlap Electronics, Inc.
Electro-Tech Equipment Co.
Ernst Norrman Laboratories
Specific Products
Winder Aircraft Corp. of Fla.

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Phase

Varo Mfg. Co.
Winder Aircraft Corp. of Fla.
Wintronics

Resistance

Barnes Development Co.
James G. Biddle Co.
Consolidated Airborne Systems, Inc.
Electro-Measurements Inc.
Gray Instrument Co.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Winder Aircraft Corp. of Fla

STANDS, WAVEGUIDE

Aircom Inc.
Ballymore Co.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Douglas Microwave Co., Inc.
J-V-M Microwave Co.
La Pointe Industries Inc
Narda Microwave Corp., The
Omega Labs., Inc.
Uniwave, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Waveline, Inc.

STATIC, ELIMINATORS

Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Merix Chemical Co.
United States Radium Corp.

STATORS, MOTOR & GENERATOR

Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Kurz & Root Co.
Precision, Inc.

STRIPS, MOUNTING

Aerolite Electronics Corp.
Allied Plastics Supply Corp.
Birnbach Radio Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electronic Techniques, Inc.
Elm Mfg. Co. Inc.
Emerson Plastics Corp.
Kulka Electric Corp.
Litton Industries, Components Div.

SUBMINIATURIZATION SERVICES

Bergen Labs.
Collins Radio Co.
***COOPER DEVELOPMENT CORP.**
Electronic Techniques, Inc.
Johnson Electronics Inc.
Librascope Inc.
Maico Electronics, Inc.
Mechanical Div.-General Mills, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Motorola Inc., Military Marketing Div.
Precision, Inc.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Topper Mfg. Co., Inc.

SUPPRESSORS, NOISE

Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Hallett Mfg. Co.
Telectro Industries Corp.
Televiso Corp.

SWITCH, GUARDS

Allied Plastics Supply Corp.
Butler-Hammer Inc.
Grimes Mfg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Neos'l Products Co.

SWITCH INERTIA

***INERTIA SWITCH DIV.-SAFE LIGHTING INC.**

SWITCHES

Advanced Products Co., The
Airtron, Inc.
Amatom Electronic Hardware Co. Inc.
Arnoux Corp.
Beckman & Whitley, Inc., Missile Products Div.
Bogart Mfg. Corp.
Burroughs Corp.
Carling Electric, Inc.
Clarostat Mfg. Co., Inc.
Cole-Hersee Co.
Consolidated Controls Corp.
F. W. Corbett Science Labs.
Cutler-Hammer Inc.
General Railway Signal Co.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
***A. W. HAYDON CO., THE**
***KAHN & CO., INC.**
Leeds & Northrup Co.
Markite Corp.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Philadelphia Scientific Glass Co.
Raymond Engrg. Laboratory, Inc.
Sage Laboratories, Inc.
Sure Brothers, Inc.
Stromberg-Carlson, Electronics Div.
Unimax Switch Div.
U. S. Gauge Div.-American Machine & Metals, Inc.
Universal Circuit Controls Corp.
Winder Aircraft Corp. of Fla.

Acceleration

Beckman & Whitley, Inc., Missile Products Div.
Bergen Labs.
Carleton Aviation Co., Inc.
Consolidated Controls Corp.
Exact Engrg. & Mfg. Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Haydon Switch, Inc.
Humphrey, Inc.
Magnavox Co., The
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Pacific Scientific Co.
Raymond Engrg. Laboratory, Inc.
Servomechanisms, Inc.
Southwestern Industries, Inc.
U.S. Gauge Div.—American Machine & Metals, Inc.
Vap-Air Div., Vapor Heating Corp.

Air Ram

Aerotec Corp., The
Bergen Labs.
Consolidated Controls Corp.
Henry G. Dietz Co., Inc., The
Essex Mfg. Co., Inc.
Greenleaf Mfg. Co., The, Div.—Mandrel Industries, Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co., Inc.
Marquardt Aircraft Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Pioneer-Central Div., Bendix Aviation Corp.
U.S. Gauge Div.—American Machine & Metals, Inc.

Aneroid

Aerotec Corp., The
Consolidated Controls Corp.
Friez Instrument Div.—Bendix Aviation Corp.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co., Inc.
***WALLACE O. LEONARD, INC.**
Minneapolis-Honeywell Regulator Co., Ordnance Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Pioneer-Central Div., Bendix Aviation Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Alarm

Consolidated Controls Corp.
Cutler-Hammer Inc.
Magnetrol, Inc.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Philadelphia Scientific Glass Co.
Recora Co., Inc., The
Sealectric Switch & Relay Corp.
Vap-Air Div., Vapor Heating Corp.
Winder Aircraft Corp. of Fla.

Automatic

Airtron, Inc.
Arnoux Corp.
Automatic Switch Co.
Cutler-Hammer Inc.
Eagle Signal Corp.
***KAHN & CO., INC.**
P. R. Mallory & Co. Inc.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Raymond Engrg. Laboratory, Inc.
Relay Sales Inc.
Sealectric Switch & Relay Corp.
Servomechanisms, Inc.

Crossbar

James Cunningham Son & Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
North Electric Co.

Control

Airtron, Inc.
Consolidated Controls Corp.
Cutler-Hammer Inc.
W. C. Dillon & Co., Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electron-Radar Products
Engelhard Industries Inc., D. E. Makepeace Div.
Exact Engrg. & Mfg. Inc.
General Electric Co., Apparatus Sales Div.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Guardian Electric Mfg. Co.
***KAHN & CO., INC.**
***WALLACE O. LEONARD, INC.**
P. R. Mallory & Co. Inc.
Marco Industries Co.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Raymond Engrg. Laboratory, Inc.
Richards Electrocraft, Inc.
Servomechanisms, Inc.
***STEVENS MFG. CO., INC.**
Unimax Switch Div.
United-Carr Fastener Corp.
Universal Circuit Controls Corp.
Winder Aircraft Corp. of Fla.

Contact

Aerolite Electronics Corp.
Airtron, Inc.
Burroughs Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Cutler-Hammer Inc.
Electron-Radar Products
Engelhard Industries Inc., D. E. Makepeace Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Richards Electrocraft, Inc.
Sealectric Switch & Relay Corp.
Switchcraft, Inc.

Decade

F. W. Corbett Science Labs.
Industrial Instruments Inc.
Leeds & Northrup Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Joseph Pollak Corp.

Duplex

***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Oil-Dyne, Inc.
G. C. Wilson & Co.

Electronic

Advanced Electronics, Inc.
Airtron, Inc.
Arnoux Corp.
Bendix Aviation Corp., York Div.
Bergen Labs.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Consolidated Airborne Systems, Inc.
Consolidated Controls Corp.
F. W. Corbett Science Labs.
Henry G. Dietz Co., Inc., The
Don-Lan Electronics Co.
Electron-Radar Products
Electronic Assoicates, Inc.
Epsco Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hammett Electric Co.
Kulka Electric Corp.
Gerard G. Leeds Co., Inc.
P. R. Mallory & Co. Inc.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Panoramic Radio Products, Inc.
Peschel Electronics, Inc.
Resdel Engrg. Corp.
Sealectric Switch & Relay Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Unimax Switch Div.

United-Carr Fastener Corp.
Walkirt Co.
Winder Aircraft Corp. of Fla.

Float

Aero Supply Mfg. Co., Inc.
Aerotec Corp., The
Cutler-Hammer Inc.
Electro-Tech Equipment Co.
Essex Mfg. Co., Inc.
Geisler Labs.
General Electric Co., Apparatus Sales Div.
Magnetrol, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Telectro Industries Corp.
United Control Corp.
Vemaline Products Co.
Wave Particle Corp.

Foot

Carling Electric, Inc.
Cole-Hersee Co.
Cutler-Hammer Inc.
Electro-Tech Equipment Co.
Thomas T. Fox Co.
General Controls Co.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Recora Co., Inc., The
Robot Appliances Inc.
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.

Hermetically Sealed

Airtron, Inc.
Automatic Electric Sales Corp.
Carleton Aviation Co., Inc.
Consolidated Controls Corp.
Cutler-Hammer Inc.
Eagle Signal Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electron-Radar Products
Exact Engrg. & Mfg. Inc.
Gordos Corp.
Hamilton Watch Co., Military Products Div.
Hamlin, Inc.
Haydon Switch, Inc.
Licon Div.-Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
P. R. Mallory & Co. Inc.
Metals & Controls Corp.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Miller-Robinson Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Ozone Metal Products Corp.
Raymond Engrg. Laboratory, Inc.
Recora Co., Inc., The
Sealectric Switch & Relay Corp.
Spencer Thermostat Div.-Metals & Controls Corp.
Telectro Industries Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Hydraulic

Aerotec Corp., The
Carleton Aviation Co., Inc.
Consolidated Controls Corp.
General Controls Co.
*WALLACE O. LEONARD, INC.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Oil-Dyne, Inc.
Recora Co., Inc., The
U. S. Gauge Div.-American Machine & Metals, Inc.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Whittaker Controls, Div.-Telecomputing Corp.

Ignition

Cole-Hersee Co.
Hammett Electric Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Joseph Pollak Corp.
Scintilla Div.-Bendix Aviation Corp.

Impact

Columbia Research Labs.
Dale Products, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
Humphrey, Inc.
Ideal-Aerosmith, Inc.
Walter Kidde & Co., Inc., Aviation Div.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Pacific Scientific Co.
Raymond Engrg. Laboratory, Inc.

Indicating

Aero Supply Mfg. Co., Inc.
Airtron, Inc.
Bergen Labs.
Cutler-Hammer Inc.
Eact Engrg. & Mfg. Inc.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
O & S Research, Inc.
Unimax Switch Div.
*WESTINGHOUSE ELECTRIC CORP.

Jack

Automatic Electric Sales Corp.
C. P. Clare & Co.
P. R. Mallory & Co. Inc.
Minneapolis-Honeywell Regulator Co., Industrial Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Richards Electrocraft, Inc.
Switchcraft, Inc.

Key

Automatic Electric Sales Corp.
Capitol Machine Co., The
F. W. Corbett Science Labs.
Cutler-Hammer Inc.
P. R. Mallory & Co. Inc.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
North Electric Co.
Switchcraft, Inc.
Telectro Industries Corp.
Universal Circuit Controls Corp.

Knife

Alden Electronic & Impulse Recording Equip. Co.
Birnbach Radio Co., Inc.
General Electric Co., Apparatus Sales Div.
Kolton Electric Mfg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Telectro Industries Corp.
*WESTINGHOUSE ELECTRIC CORP.

Limit

Airtron, Inc.
Arch Gear Works Inc.
Automatic Electric Sales Corp.
Cutler-Hammer Inc.
Electro-Tech Equipment Co.
Exact Engrg. & Mfg. Inc.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Haydon Switch, Inc.
Janco Corp.
Licon Div.-Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
Magnetrol, Inc.
Metals & Controls Corp.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Robot Appliances Inc.
Sealectric Switch & Relay Corp.
Spencer Thermostat Div.-Metals & Controls Corp.
M. Ten Bosch, Inc.
Unimax Switch Div.
*WESTINGHOUSE ELECTRIC CORP.

Liquid Oxygen Control

Consolidated Airborne Systems, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Pioneer-Central Div., Bendix Aviation Corp.
Progressive Research & Development Co., Inc.
Servomechanisms, Inc.
United Control Corp.

Mach Limit

Cutler-Hammer Inc.
Eclipse-Pioneer Div.-Bendix Aviation Corp.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
*WALLACE O. LEONARD, INC.
Marquardt Aircraft Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Pioneer-Central Div., Bendix Aviation Corp.
Specialties, Inc.

Mechanical Control

Airtron, Inc.
Cole-Hersee Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Exact Engrg. & Mfg. Inc.

Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
*KAHN & CO., INC.
Licon & Spiroid Divs., Illinois Tool Works
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Joseph Pollak Corp.
Raymond Engrg. Laboratory, Inc.
Robot Appliances Inc.
Techanical Oil Tool Corp.
Universal Circuit Controls Corp.

Mercury

Anchor Metal Co. Inc.
Ebert Electronics Corp.
Electron-Radar Products
Electro-Tech Equipment Co.
General Controls Co.
Gordos Corp.
Hamlin, Inc.
E. Vernon Hill & Co.
Mercury Contacts, Inc.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
Robot Appliances Inc.
Servomechanisms, Inc.
Telectro Industries Corp.
United-Carr Fastener Corp.
Vap-Air Div., Vapor Heating Corp.

Microphone

Canoga Corp. of California
Thomas T. Fox Co.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Roflan Co., The
Shure Brothers, Inc.

Microwave

Airtron, Inc.
Canoga Corp. of California
Joe Davidson & Associates
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Electron-Radar Products
Engelhard Industries Inc., D. E. Makepeace Div.
General Communication Co.
Goodyear Aircraft Corp.
Gerard G. Leeds Co., Inc.
Marco Industries Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
*TELERAD MFG. CORP.
Transco Products, Inc.
Uniwave, Inc.
Waveline, Inc.

Miniature

Airtron, Inc.
Amatom Electronic Hardware Co. Inc.
Carling Electric, Inc.
Clarostat Mfg. Co., Inc.
Cutler-Hammer Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro-Tech Equipment Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Exact Engrg. & Mfg. Inc.
Haydon Switch, Inc.
Licon Div.-Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
P. R. Mallory & Co. Inc.
Metals & Controls Corp.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Oil-Dyne, Inc.
Joseph Pollak Corp.
Poly-Scientific Corp.
Recora Co., Inc., The
Switchcraft, Inc.
Unimax Switch Div.
United-Carr Fastener Corp.

Oil Immersed

General Electric Co., Apparatus Sales Div.
Haydon Switch, Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Unimax Switch Div.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
*WESTINGHOUSE ELECTRIC CORP.

Plunger

Carline Electric, Inc.
Gordos Corp.
Haydon Switch, Inc.

guidance

Licon Div.-Illinois Tool Works
P. R. Mallory & Co. Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Philadelphia Scientific Glass Co.
Spencer Thermostat Div.-Metals & Controls Corp.
Unimax Switch Div.
United-Carr Fastener Corp.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

Pressure

Aero Supply Mfg. Co., Inc.
Aerotec Corp., The
Barksdale Valves
Carleton Aviation Co., Inc.
Cole-Hersee Co.
Consolidated Controls Corp.
***CORNELIUS CO., THE**
Cutler-Hammer Inc.
Henry G. Dietz Co., Inc., The
W. C. Dillon & Co., Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Essex Mfg. Co., Inc.
Friez Instrument Div.-Bendix Aviation Corp.
General Controls Co.
General Electric Co., Apparatus Sales Div.
B. F. Goodrich Aviation Products
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Halax Corp.
Hydra-Power Corp.
Ideal Aerosmith, Inc.
Kemp Aero Products, Div.-Kemp Inc.
Walter Kidde & Co., Inc., Aviation Div.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Lear, Inc.
Licon Div.-Illinois Tool Works
Meletron Corp.
Miller-Robinson Co.
Minneapolis-Honeywell Regulator Co., Industrial Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Oil-Dyne, Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Robot Appliances Inc.
Ryan Aeronautical Co.
Sealectric Switch & Relay Corp.
Southwestern Industries, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Whittaker Controls, Div.-Telecomputing Corp.

Printed Circuit

Airtron, Inc.
American Printed Circuits Co., Inc.
Cleveland Metal Specialties Co.
Dale Products, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
P. R. Mallory & Co. Inc.
Milmanco
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Precision Circuits Inc.
Rogers Corp.
Ryan Aeronautical Co.
Spectrol Electronics Div., Carrier Corp.
Star Engraving Co., Ltd.
Techniques, Inc.
Ucinite Co., The, Div.-United-Carr Fastener Corp.
United-Carr Fastener Corp.

Pulse

Airtron, Inc.
Gordos Corp.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Skiatron Electronics & Television Corp.

Pushbutton

Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Automatic Electric Sales Corp.
Birnbach Radio Co., Inc.
Capitol Machine Co., The
Cole-Hersee Co.
F. W. Corbett Science Labs.
Cutler-Hammer Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Haydon Swtich, Inc.
Leeds & Northrup Co.
Licon Div.-Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
P. R. Mallory & Co. Inc.
Marco Industries Co.
Metals & Controls Corp.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
North Electric Co.
O & S Research, Inc.
Richards Electrocraft, Inc.
Robot Appliances Inc.
Roflan Co., The
Spencer Thermostat Div.-Metals & Controls Corp.
Star Engraving Co., Ltd.
Switchcraft, Inc.
Telectro Industries Corp.
Unimax Switch Div.
United Supply Co.
United-Carr Fastener Corp.
Universal Circuit Controls Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Radio

American Brass Co., The
Birnbach Radio Co., Inc.
Carling Electric, Inc.
Cutler-Hammer Inc.
***DATA-CONTROL SYSTEMS INC.**
General Cement Mfg. Co., Div.-Textron Inc.
General Communication Co.
Hycon Eastern Inc.
P. R. Mallory & Co. Inc.
Micro Switch, Div.-Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Telectro Industries Corp.
Ucinite Co., The, Div.-United-Carr Fastener Corp.
Winder Aircraft Corp. of Fla.

Remote Control

Automatic Switch Co.
Automotive & Aircraft Div.-American Chain & Cable Co., Inc.
James Cunningham Son & Co., Inc.
Cutler-Hammer Inc.
***DATA-CONTROL SYSTEMS INC.**
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Communication Co.
***KAHN & CO., INC.**
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Powers Regulator Co., The
Robot Appliances Inc.
Telectro Industries Corp.
Teleflex Inc.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.
Zenith Electric Co.

Reset

Advanced Products Co., The
Airflyte Electronics Co.
Cutler-Hammer Inc.
Elgin Micronics Div.-Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
Licon Div.-Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
P. R. Mallory & Co. Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Nemeth, Inc.
Sealectric Switch & Relay Corp.
Unimax Switch Div.

Rotary

Airflyte Electronics Co.
Airtron, Inc.
Amatom Electronic Hardware Co. Inc.
Birnbach Radio Co., Inc.
Carling Electric, Inc.
Clarostat Mfg. Co., Inc.
Cole-Hersee Co.
Computer Instruments Corp.
Cutler-Hammer Inc.
Elektro-Serv Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
General Cement Mfg. Co., Div.-Textron Inc.
General Communication Co.
General Electric Co., Apparatus Sales Div.
***GRAPHITE METALLIZING CORP.**
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Industrial Instruments Inc.
Instrument Development Laboratories, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Janco Corp.
Leeds & Northrup Co.
Licon Div.-Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
Magnavox Co., The
P. R. Mallory & Co. Inc.
Markite Corp.
Metals & Controls Corp.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
North Electric Co.
Joseph Pollak Corp.
Poly-Scientific Corp.
Relay Sales Inc.
Robot Appliances Inc.
Sealectric Switch & Relay Corp.
Spencer Thermostat Div.-Metals & Controls Corp.
Switchcraft, Inc.
Ucinite Co., The, Div.—United-Carr Fastener Corp.

Rotary Chopper

Airflyte Electronics Co.
Computer Instruments Corp.
Electro Tec Corp.
Elektro-Serv Co.
***GRAPHITE METALLIZING CORP.**
Hammett Electric Co.
Magnavox Co., The
Markite Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Mycalex Corp. of America
Nemeth, Inc.
Poly-Scientific Corp.
Telectro Industries Corp.
Uniwave, Inc.

Rotary Sampling

Airflyte Electronics Co.
Computer Instruments Corp.
Electro Tec Corp.
Elektro-Serv Co.
Hammett Electric Co.
Instrument Development Laboratories, Inc.
Magnavox Co., The
Markite Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Mycalex Corp. of America
Nemeth, Inc.
Poly-Scienific Corp.
Telectro Industries Corp.

Rotary Selector

Airtron, Inc.
Clarostat Mfg. Co., Inc.
Computer Instruments Corp.
Cutler-Hammer Inc.
Electro Development Co.
Electro Tec Corp.
Essex Mfg. Co., Inc.
General Railway Signal Co.
Hammett Electric Co.
Janco Corp.
G. H. Leland, Inc.
Lewis Engrg. Co., The
Magnavox Co., The
P. R. Mallory & Co. Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Joseph Pollak Corp.
Thompson Products, Inc.
Ucinite Co., The, Div.-United-Carr Fastener Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Safety

Beckman & Whitley, Inc., Missile Products Div.
Cole-Hersee Co.
Cutler-Hammer Inc.
Licon Div.-Illinois Tool Works
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Recora Co., Inc., The
Unimax Switch Div.
***WESTINGHOUSE ELECTRIC CORP.**

Slide

Birnbach Radio Co., Inc.
Carling Electric, Inc.
Cole-Hersee Co.
Continental Carbon, Div.-Wirt Co.
Cutler-Hammer Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
P. R. Mallory & Co. Inc.
Marco Industries Co.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**

Snap Action

Amatom Electronic Hardware Co., Inc.
Atlas E-E Corp.
Carling Electric, Inc.
Clarostat Mfg. Co., Inc.
Cole-Hersee Co.
Cutler-Hammer Inc.
Ebert Electronics Corp.
Electro-Tech Equipment Co.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Haydon Switch, Inc.
Kulka Electric Corp.
Licon Div.-Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
P. R. Mallory & Co. Inc.
Metals & Controls Corp.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Nemeth, Inc.
Network Mfg. Corp.
George Ulanet Co.
Joseph Pollack Corp.
Recora Co., Inc., The
Sealectric Switch & Relay Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
Unimax Switch Div.
United Supply Co.
*WESTINGHOUSE ELECTRIC CORP.

Specialty

Airtron, Inc.
C. P. Clare & Co.
James Cunningham Son & Co., Inc.
Cutler-Hammer, Inc.
Elektro-Serv Co.
Elgin Micronics, West Coast Div.—Elgin National Watch Co.
Gordos Corp.
Licon Div.—Illinois Tool Works
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Nemeth, Inc.
Raymond Engrg. Laboratory, Inc.
Sealectric Switch & Relay Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United Supply Co.
Universal Circuit Controls Corp.

Step Type

Automatic Electric Sales Corp.
Bergen Labs.
Cutler-Hammer, Inc.
Hamilton Watch Co., Military Products Div.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
G. H. Leland, Inc.
P. R. Mallory & Co., Inc.
Micro-Switch, Div.—Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
North Electric Co.
Relay Sales, Inc.

Sub-Miniature

Airtron, Inc.
Amatom Electronic Hardware Co., Inc.
Cutler-Hammer, Inc.
Elektro-Serv Co.
Englehard Industries, Inc., D. E. Makepeace Div.
Hamilton Watch Co., Military Products Div.
Haydon Switch, Inc.
Licon Div.—Illinois Tool Works
Licon & Spiroid Divs.—Illinois Tool Works
P. R. Mallory & Co., Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Poly-Scientific Corp.
Recora Co., Inc., The
Richards Electrocraft, Inc.
Sealectric Switch & Relay Corp.
Spencer Thermostat Div.—Metals & Controls Corp.
Unimax Switch Div.

Tap

Cutler-Hammer, Inc.
Electro-Tech Equipment Co.
Hammett Electric Co.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Joseph Pollak Corp.
Universal Circuit Controls Corp.
*WESTINGHOUSE ELECTRIC CORP.

Telemetering

American Printed Circuits Co., Inc.
Arnoux Corp.
Burroughs Corp., Electronic Tube Div.
Computer Instruments Corp.
Consolidated Electrodynamics Corp.
*DATA-CONTROL SYSTEMS, INC.
Electro Tec Corp.
Electronic Techniques, Inc.
Elektro-Serv Co.
Epsco, Inc.
*A. W. HAYDON CO., THE
Instrument Development Laboratories, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Mycalex Corp. of America
Pacific Div.—Bendix Aviation Corp.
Poly-Scientific Corp.
Talley Corp., The
Uniwave, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Temperature Control

Atlantic Instrument., Sub.—American Electronics, Inc.
Consolidated Controls Corp.
Fenwal, Inc.
G-V Controls, Inc.
Kennametal, Inc.
Metals & Controls Corp.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
August E. Miller Laboratories
Minneapolis-Honeywell Regulator Co., Inustrial Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
George Ulanet Co.
Powers Regulator Co., The
Scientific Instrument Co.
*STEVENS MFG. CO., INC.
Talley Corp., The
United Control Corp.
Vap-Air Div., Vapor Heating Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wilcolator Co., The

Thermal

Blonder-Tongue Labs., Inc.
Consolidated Controls Corp.
Cutler-Hammer, Inc.
Ebert Electronics Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electron-Radar Products
G-V Controls, Inc.
Hammett Electric Co.
E. Vernon Hill & Co.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Nemeth, Inc.
George Ulanet Co.
United Control Corp.
Universal Circuit Controls Corp.
Vap-Air Div., Vapor Heating Corp.
Wilcolator Co., The

Timing

Abrams Instrument Corp.
Advanced Products Co., The
Cutler-Hammer, Inc.
Joe Davidson & Associates
Henry G. Dietz Co., Inc., The
Dimco-Gray Co.
Eagle Signal Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Elgin National Watch Co.
Exact Engrg. & Mfg., Inc.
Friez Instrument Div.—Bendix Aviation Corp.
General Electric Co., Apparatus Sales Div.
Greenleaf Mfg. Co., The, Div.—Mandrel Industries, Inc.
Hammett Electric Co.
*A. W. HAYDON CO., THE
Haydon Div.-General Time Corp.
Industrial Electronic Engineers
*KAHN & CO., INC.
P. R. Mallory & Co., Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
George Ulanet Co.
Poly-Scientific Corp.
Raymond Engrg. Laboratory, Inc.
Reliance Automatic Lighting Co.
Technical Oil Tool Corp.
Tempo Instrument, Inc.
Vemaline Products Co.
*WESTINGHOUSE ELECTRIC CO.
G. C. Wilson & Co.
Zenith Electric Co.

Toggle

Amatom Electronic Hardware Co., Inc.
Birnbach Radio Co., Inc.
Carling Electric, Inc.
Cole-Hersee Co.
Cutler-Hammer, Inc.
Electro-Tech Equipment Co.
Essex Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Haydon Switch, Inc.
Kulka Electric Corp.
Lear, Inc.
Licon Div.—Illinois Tool Works
Licon & Spiroid Divs., Illinois Tool Works
Master Appliance Mfg. Co.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Network Mfg. Corp.
Robot Appliances, Inc.
Spencer Thermostat Div.—Metals & Controls Corp.
Western International Co.

Transformer

Eisler Engrg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Transonic, Inc.

Transistor

Cutler-Hammer, Inc.
Electronic Techniques, Inc.
Hughes Products, Hughes Aircraft Co., Semiconductor Div.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Tempo Instrument, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Vacuum

Barksdale Valves
Consolidated Controls Corp.
*CORNELIUS CO., THE
Cutler-Hammer, Inc.
Henry G. Dietz Co., Inc., The
Gordos Corp.
Green Rectifier Co.
High Vacuum Equipment Corp.
Jennings Radio Mfg. Corp.
Philadelphia Scientific Glass Co.
Pioneer-Central Div., Bendix Aviation Corp.
Research Appliance Co.
Vacuum Tube Products Co., Inc.
Veco Vacuum Corp.

Wavechange Receiver

Demornay-Bonardi

Wavechange Transmitter

Demornay-Bonardi

Waveguide

Airtron, Inc.
Bogart Mfg. Corp.
Canoga Corp. of California
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
J-V-M Microwave Co.
Metals & Controls Corp.
Microwave Development Labs., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
*TELERAD MFG. CORP.
Thompson Products, Inc.
Uniwave, Inc.
Waveline, Inc.
Westbury Electronics, Inc.

Waveguide Microwave

Airtron, Inc.
Bogart Mfg. Corp.
Canoga Corp. of California
Joe Davidson & Associates
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Don-Lan Electronics Co.
Douglas Microwave Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
J-V-M Microwave Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
Radar Design Corp.
Ryan Aeronautical Co.

Sage Laboratories, Inc.
Technical Oil Tool Corp.
*TELERAD MFG. CORP.
Thompson Products, Inc.
Uniwave, Inc.
Waveline, Inc.
Westbury Electronics, Inc.

SWITCHING EQUIPMENT, ANTENNA

Airtron, Inc.
Autonetics, Div.—North American Aviation, Inc.
Bogart Mfg. Corp.
Collins Radio Co.
James Cunningham Son & Co., Inc.
Don-Lan Electronics Co.
General Communication Co.
Goodyear Aircraft Corp.
La Pointe Industries, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Prodelin, Inc.
Ryan Aeronautical Co.
Technical Appliance Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.—Vitro Corp. of America.
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Westbury Electronics, Inc.
Wilcox Electric Co., Inc.
Wind Turbine Co.

SYNCHROS

Clifton Precision Products Co., Inc.

TARGET DEVICES

Infra-red, radar
*COOPER DEVELOPMENT CORP.

TERMINAL BLOCKS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Amatom Electronics Hardware Co., Inc.
Automatic Electric Sales Corp.
Burndy Corp., Omaton Div.
Cole-Hersee Co.
Continental Connector Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Cutler-Hammer Inc.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Components Inc.
General Railway Signal Co.
Gunnar Laboratories
Helipot Corp.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Jodee Plastics Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kasar Mfg. & Distributing Co., Inc.
Kolton Electric Mfg. Co.
Kulka Electric Corp.
Litton Industries, Components Div.
Molding Corp. of America
National Tel-Tronics Corp.
Olympic Plastics Co., Inc.
St. Regis Paper Co.
Silicone Insulation, Inc.
Star Engraving Co., Ltd.
Stromberg-Carlson, Electronics Div.
Superior Carbon Products, Inc.
Telectro Industries Corp.
Tingstol Co.

TERMINAL BOARDS

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
Anchor Specialty Mfg. Co. Inc.
Cal-Ohm Labs., Inc.
Cole-Hersee Co.
Continental Connector Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dalmore Corp.
Electronic Techniques, Inc.
Elm Mfg. Co. Inc.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Components Inc.
General Railway Signal Co.
Gunnar Laboratories
Hobson Brothers, Inc.
Walter K. Jaros, Aircrafters
Jodee Plastics Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kasar Mfg. & Distributing Co., Inc.
Keystone Electronics Corp.
Kulka Electric Corp.
Litton Industries, Components Div.
Methode Mfg. Corp.
Molding Corp. of America
National Tel-Tronics Corp.
Olympic Plastics Co., Inc.
Republic Aviation Corp., Guided Missiles Div.
St. Regis Paper Co.
Silicone Insulation, Inc.
Star Engraving Co., Ltd.
Stromberg-Carlson, Electronics Div.
Superior Carbon Products, Inc.
Techniques, Inc.
Telectro Industries Corp.
Tingstol Co.
Tri-Dex Co.
Vector Electronic Co.

TERMINAL, STRIPS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Automatic Electric Sales Corp.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Cal-Ohm Labs., Inc.
Continental Connector Corp.
Electronic Techniques, Inc.
Electro-Tech Equipment Co.
Elm Mfg. Co. Inc.
Emerson Plastics Corp.
Enflo Corp.
Federal Screw Products Inc.
Garde Mfg. Co.
General Cement Mfg. Co., Div.-Textron Inc.
General Components Inc.
General Railway Signal Co.
Gunnar Laboratories
Industrial Engravers Inc.
Walter K. Jaros, Aircrafters
Jodee Plastics Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kulka Electric Corp.
Litton Industries, Components Div.
Molding Corp. of America
National Tel-Tronics Corp.
Olympic Plastics Co., Inc.
Silicone Insulation, Inc.
Sohl Co., The
Star Engraving Co., Ltd.
Stromberg-Carlson, Electronics Div.
Tingstol Co.
Tri-Dex Co.
Vector Electronic Co.
Waldom Electronics Inc.

TERMINAL, LUG SWAGGERS

Burndy Corp., Omaton Div.
Continental Connector Corp.
Electronic Techniques, Inc.
General Components Inc.
Hobson Brothers, Inc.
Walter K. Jaros, Aircrafters
Keystone Electronics Corp.
Kulka Electric Corp.
Litton Industries Components Div.
National Tel-Tronics Corp.

TERMINALS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Automotive & Aircraft Div.-American Chain & Cable Co., Inc.
Birnbach Radio Co., Inc.
Brighton Tool & Die Co.
Continental Connector Corp.
Dalmore Corp.
Dejur-Amsco Corp.
Diamonite Products Mfg. Co.
Electrical Industries, Div.-Philips Electronics, Inc.
Enflo Corp.
Federal Screw Products Inc.
Fusite Corp.
Garde Mfg. Co.
General Cement Mfg. Co., Div.-Textron Inc.
General Ceramics Corp.
General Components Inc.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Keystone Electronics Corp.
Kulka Electric Corp.
Litton Industries, Components Div.
Lundy Associates Inc.
John Marshall Associates, Inc.
Molding Corp. of America
National Tel-Tronics Corp.
Stromberg-Carlson, Electronics Div.
Waldom Electronics Inc.

Hermetically Sealed

Ceramaseal, Inc.
L. L. Constantin & Co.
Continental Connector Corp.
Corning Glass Works
Diamonite Products Mfg. Co.
Electrical Industries, Div.-Philips Electronics, Inc.
Enflo Corp.
Fusite Corp.
Garde Mfg. Co.
General Ceramics Corp.
Joclin Mfg. Co.
Keystone Electronics Corp.
Lundy Associates Inc.
McCormick Selph Associates
Molding Corp. of America
Chester Morton Electronics Corp.
Strat-O-Seal Mfg. Co.
Thermo Materials, Inc.
Vemaline Products Co.
Winchester Electronics, Inc.

Miniature & Subminiature

Accurate Electronics Corp., Dept. D
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
Cal-Ohm Labs., Inc.
Circon Component Corp.
Continental Connector Corp.
Dejur-Amsco Corp.
Diamonite Products Mfg. Co.
Electrical Industries, Div.-Philips Electronics, Inc.
Electronic Techniques, Inc.
Enflo Corp.
Garde Mfg. Co.
General Components Inc.
Goe Engrg. Co.
Joclin Mfg. Co.
Keystone Electronics Corp.
Kulka Electric Corp.
Litton Industries, Components Div.
Lundy Associates Inc.
Malco Tool & Mfg. Co.
Molding Corp. of America
North Electric Co.
Strat-O-Seal Mfg. Co.
Thermo Materials, Inc.
Vemaline Products Co.
Winchester Electronics, Inc.

Snap

Kulka Electric Corp.
John Marshall Associates, Inc.

Solderless

Amp Inc.
Amatom Electronic Hardware Co. Inc.
Brighton Tool & Die Co.
Burndy Corp., Omaton Div.
Cole-Hersee Co.
Dejur-Amsco Corp.
Garde Mfg. Co.
General Components Inc.
Hobson Brothers, Inc.
Kolton Electric Mfg. Co.
Malco Tool & Mfg. Co.
Waldom Electronics Inc.
Winchester Electronics, Inc.

Standoff

Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
Birnbach Radio Co., Inc.
Cal-Ohm Labs., Inc.
Continental Connector Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dejur-Amsco Corp.
Electronic Techniques, Inc.
Enflo Corp.
Fusite Corp.
Garde Mfg. Co.
General Components Inc.
Goe Engrg. Co.
Hallamore Electronics Co.
Hobson Brothers, Inc.
Isolantite Mfg. Corp.
Litton Industries, Components Div.
Molding Corp. of America
Strat-O-Seal Mfg. Co.
Tri-Point Plastics, Inc.
Winchester Electronics, Inc.

Wire and Cable

Aerolite Electronics Corp.
All American Aircraft Products, Inc.
Belden Mfg. Co.
Burndy Corp., Omaton Div.
Ceramaseal, Inc.
Cole-Hersee Co.
ESC Corp.
Electric Auto-Lite Co., The, Wire & Cable Div.
Freeman Co., The
Hallamore Electronics Co.
Hallett Mfg. Co.
Joclin Mfg. Co.
Kolton Electric Mfg. Co.
Malco Tool & Mfg. Co.
Polyphase Instrument Co.
Standard Electronics Div., Radio Engrg. Labs., Inc.
Tensor Electric Development Co., Inc.
Victor Electric Wire & Cable Corp.
Waldom Electronics, Inc.

TRANSFORMERS

- Acme Electric Corp.
- Acro Products Co.
- Advance Industries, Inc.
- Airdesign Corp.
- Airtron, Inc.
- Aladdin Electronics, Div.—Aladdin Industries, Inc.
- Alto Scientific Co., Inc.
- American Welding & Mfg. Co., The
- Bogue Electric Mfg. Co.
- Burroughs Corp.
- Carad Corp.
- Celco-Constantine Engrg. Laboratories Co.
- Central Coil Co., Inc.
- Central Transformer Co.
- Chicago Standard Transformer Corp.
- Coil Co. of America
- Del Electronics Corp.
- Dinion Coil Co., Inc.
- Eisler Engrg. Co., Inc.
- Electro Engrg. Works
- Electronic Transformer Co., Inc.
- Epco Products, Inc.
- General Railway Signal Co.
- Goslin Electric & Mfg. Co.
- Green Rectifier Co.
- Guided Missile Div.—De Havilland Aircraft of Canada, Ltd.
- Hallamore Electronics Co.
- Hermetic Seal Transformer Co., Div.—Southwestern Industrial Electronics
- Hevi-Duty Electric Co.
- Highland Engrg. Co.
- *INTERELECTRONICS CORP.
- Keystone Products Co.
- Magnetico, Inc.
- Mara Electronics, Inc.
- McKenna Labs.
- Munston Mfg. & Service, Inc.
- NYT Electronics, Inc.
- National Coil Co.
- New York Coil Co., Inc.
- New York Transformer Co., Inc.
- Ortho Filter Corp.
- Osborne Electronic Sales Corp.
- Polyphase Instrument Co.
- RS Electronics Corp.
- Ram Electronics, Inc.
- Ryan Aeronautical Co.
- Servomechanisms, Inc.
- Signal Transformer Co.
- Southwestern Industrial Electronics Co.
- Standard Electronics Div., Radio Engrg. Labs., Inc.
- Sterling Tranformer Corp.
- Superex Electronics Corp.
- Telectro Industries Corp.
- Terminal Radio Corp.
- Transonic, Inc.
- Tresco, Inc.
- Triad Tranformer Corp.
- United Transformer Corp.
- Varo Mfg. Co.
- Vibration Research Labs., Inc.
- Warren Transformer Co., Inc.
- Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Output

- Acme Electric Corp.
- Acro Products Co.
- Advance Industries, Inc.
- Advanced Electronics, Inc.
- Airdesign Corp.
- Airtron, Inc.
- Bogue Electric Mfg. Co.
- Carad Corp.
- Celco-Constantine Engrg. Laboratories Co.
- Central Coil Co., Inc.
- Central Transformer Co.
- Chicago Standard Transformer Corp.
- Coil Co. of America
- Del Electronics Corp.
- Dinion Coil Co., Inc.
- Electrical Windings, Inc.
- Electro Engrg. Works
- Electronic Transformer Co., Inc.
- Epco Products, Inc.
- Goslin Electric & Mfg. Co.
- Guided Missile Div.—De Havilland Aircraft of Canada, Ltd.
- Hermetic Seal Transformer Co., Div.—Southwestern Industrial Electronics
- Hevi-Duty Electric Co.
- Highland Engrg. Co.
- Hindle Transformer Co., Inc.
- *INTERELECTRONICS CORP.
- Keystone Products Co.
- Magnetico, Inc.
- Mara Electronics, Inc.
- J. J. Monaghan Co., Inc.
- Munston Mfg. & Service, Inc.
- NYT Electronics, Inc.
- New York Coil Co., Inc.
- New York Transformer Co., Inc.
- Ortho Filter Corp.
- Osborne Electronic Sales Corp.
- Polyphase Instrument Co.
- RS Electronics Corp.
- Ram Electronics, Inc.
- Ryan Aeronautical Co.
- Sangamo Electric Co.
- Saratoga Industries
- Signal Transformer Co.
- Southwestern Industrial Electronics Co.
- Standard Electronics Div.-Radio Engrg. Labs. Inc.
- Standard Transformer Co.
- Sterling Transformer Corp.
- Telectro Industries Corp.
- Tensor Electric Development Co., Inc.
- Terminal Radio Corp.
- Todd Products Co., Inc.
- Transformers, Inc.
- Transonic, Inc.
- Tresco, Inc.
- Triad Transformer Corp.
- United Transformer Corp.
- Varo Mfg. Co.
- Vibration Research Labs., Inc.
- Warren Transformer Co., Inc.
- Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Power

- Acme Electric Corp.
- Acro Products Co.
- Advance Industries, Inc.
- Advanced Electronics, Inc.
- Airdesign Corp.
- Airtron, Inc.
- Bogue Electric Mfg. Co.
- Celco-Constantine Engrg. Laboratories Co.
- Central Coil Co., Inc.
- Central Transformer Co.
- Chicago Electronic Engrg. Co., Inc.
- Chicago Standard Transformer Corp.
- Coil Co. of America
- Del Electronics Corp.
- Dinion Coil Co., Inc.
- ESC Corp.
- Electrical Windings, Inc.
- Electro Engrg. Works
- General Electric Co., Apparatus Sales Div.
- General Precision Lab., Inc.
- General Railway Signal Co.
- Goslin Electric & Mfg. Co.
- Green Rectifier Co.
- Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
- Hermetic Seal Transformer Co., Div.—Southwestern Industrial Electronics
- Hevi-Duty Electric Co.
- Highland Engrg. Co.
- Hindle Transformer Co., Inc.
- *INTERELECTRONICS CORP.
- Keystone Products Co.
- Magnetico, Inc.
- Mara Electronics, Inc.
- J. J. Monaghan Co., Inc.
- Munston Mfg. & Service, Inc.
- NYT Electronics, Inc.
- New York Coil Co., Inc.
- New York Transformer Co., Inc.
- Osborne Electronic Sales Corp.
- Polyphase Instrument Co.
- RS Electronics Corp.
- Ram Electronics, Inc.
- Ryan Aeronautical Co.
- Sangamo Electric Co.
- Saratoga Industries
- Signal Transformer Co.
- Southwestern Industrial Electronics Co.
- Standard Electronics Div., Radio Engrg. Labs., Inc.
- Standard Transformer Co.
- Sterling Transformer Corp.
- Superior Electric Co., The
- Telectro Industries Corp.
- Tensor Electric Development Co., Inc.
- Terminal Radio Corp.
- Todd Products Co., Inc.
- Transformers, Inc.
- Transonic, Inc.
- Tresco, Inc.
- Triad Transformer Corp.
- United Transformer Corp.
- Varo Mfg. Co.
- Vibration Research Labs., Inc.
- Warren Transformer Co., Inc.
- *WESTINGHOUSE ELECTRIC CORP.
- Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Precision Voltage Dividing

- Acro Products Co.
- Acromag Inc.
- Airtron, Inc.
- Carad Corp.
- Celco-Constantine Engrg. Laboratories Co.
- Central Transformer Co.
- Coil Co. of America
- Del Electronics Corp.
- ESC Corp.
- Electronic Transformer Co., Inc.
- Epco Products Inc.
- General Precision Lab. Inc.
- Goslin Electric & Mfg. Co.
- Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
- Hevi-Duty Electric Co.
- Highland Engrg. Co.
- *INTERELECTRONICS CORP.
- Keystone Products Co.
- Magnetico, Inc.
- J. J. Monaghan Co., Inc.
- New York Transformer Co. Inc.
- Osborne Electronic Sales Corp.
- Polyphase Instrument Co.
- Quick Charge Corp.
- RS Electronics Corp.
- Ryan Aeronautical Co.
- Saratoga Industries
- Signal Transformer Co.
- Southwestern Industrial Electronics Co.
- Standard Electronics Div., Radio Engrg. Labs. Inc.
- Standard Transformer Co.
- Telectro Industries Corp.
- Terminal Radio Corp.
- Transformers, Inc.
- Transonic, Inc.
- Triad Transformer Corp.
- United Transformer Corp.
- Varo Mfg. Co.
- Warren Transformer Co., Inc.
- Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Pulse

- Acme Electric Corp.
- Advance Industries, Inc.
- Airdesign Corp.
- Airtron, Inc.
- Aladdin Electronics, Div.-Aladdin Industries Inc.
- Alto Scientific Co., Inc.
- Bendix Aviation Corp., York Div.
- Burroughs Corp.
- Carad Corp.
- Chicago Standard Transformer Corp.
- Digitronics Corp.
- Dinion Coil Co., Inc.
- ESC Corp.
- Electronic Transformer Co., Inc.
- Epsco Inc.
- Erie Resistor Corp.
- Filtron Co. Inc.
- Fugle-Miller Labs Inc.
- General Instrument Corp., Defense Products Div.
- Goslin Electric & Mfg. Co.
- Gudeman Co., The
- Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
- Hevi-Duty Electric Co.
- Johnson Electronics Inc.
- J. J. Monaghan Co., Inc.
- NYT Electronics, Inc.
- New York Transformer Co. Inc.
- Orbitran Co., Inc.
- Osborne Electronic Sales Corp.
- Pearson Electronics
- Polyphase Instrument Co.
- Pulse Engrg., Inc.
- RS Electronics Corp.
- Ram Electronics Inc.
- Ryan Aeronautical Co.
- Saratoga Industries
- Signal Transformer Co.
- Southwestern Industrial Electronics Co.
- Standard Electronics Div., Radio Engrg. Labs. Inc.
- Technitrol Engrg. Co.
- Telectro Industries Corp.
- Tensor Electric Development Co., Inc.
- Terminal Radio Corp.
- Transformers, Inc.
- Transonic, Inc.
- Tresco, Inc.
- Triad Transformer Corp.
- United Transformer Corp.
- Varo Mfg. Co.
- Warren Transformer Co., Inc.
- Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

R-f and I-f

- Airtron, Inc.
- Aladdin Electronics, Div.-Aladdin Industries Inc.
- Carad Corp.
- Epco Products Inc.
- Fugle-Miller Labs Inc.
- General Instrument Corp., Defense Products Div.
- General R-F Fittings, Inc.
- Goslin Electric & Mfg. Co.
- Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
- Johnson Electronics Inc.
- Keystone Products Co.
- Lenkurt Electric Co., Inc.
- J. W. Miller Co.
- J. J. Monaghan Co., Inc.
- NYT Electronics, Inc.
- National Coil Co.
- New York Coil Co., Inc.
- North Hills Electric Co., Inc.
- Osborne Electronic Sales Corp.
- RS Electronics Corp.
- Radio Industries, Inc.
- Ram Electronics Inc.
- Redman Electronics Corp.
- Ryan Aeronautical Co.
- Signal Transformer Co.
- Sioux Radio Products
- Southwestern Industrial Electronics Co.
- Superex Electronics Corp.
- Tele-Coil Co.
- Telectro Industries Corp.
- Tensor Electric Development Co., Inc.
- Terminal Radio Corp.
- Vanguard Electronics Co.

. . . guidance

Varo Mfg. Co.
Western Coil Products Co.

Ultrasonic

Acoustica Associates, Inc.
Central Transformer Co.
Chicago Standard Transformer Corp.
Electronic Transformer Co., Inc.
Goslin Electric & Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
*INTERELECTRONICS CORP.
McKenna Labs.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
New York Transformer Co. Inc.
North Hills Electric Co., Inc.
Osborne Electronic Sales Corp.
Polyphase Instrument Co.
Ryan Aeronautical Co
Southwestern Industrial Electronics Co.
Sterling Transformer Corp
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Todd Products Co., Inc.
Transformers, Inc.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

TRANSISTOR, ANALYZERS

American Electronics, Inc.
Baird-Atomic, Inc
Barnes Development Co.
Consolidated Avionics Corp.
Cubic Corp.
General Instrument Corp., Defense Products Div.
Haller Raymond & Brown Inc.
Kay Electric Co.
Owen Labs., Inc.
Ryan Aeronautical Co.
Sonex, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Trans Electronics, Inc.
Ultradyne, Inc.

TRANSISTORS

Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Clevite Transistor Products, Div.-Clevite Corp.
General Instrument Corp., Defense Products Div.
*INTERELECTRONICS CORP.
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Germanium

Bendix Aviation Corp., Red Bank Div.
Clevite Transistor Products, Div.-Clevite Corp.
General Instrument Corp., Defense Products Div.
Hughes Products, Hughes Aircraft Co., Semiconductor Div.
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div.
Motorola Inc., Military Marketing Div.
Motorola Semiconductor Products Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
Transitron Electronic Corp.
*WESTINGHOUSE ELECTRIC CORP.

Germanium, Power

Bendix Aviation Corp., Red Bank Div.
Clevite Transistor Products, Div.-Clevite Corp.
General Instrument Corp., Defense Products Div.
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Junction

Bendix Aviation Corp., Red Bank Div.
Clevite Transistor Products, Div.-Clevite Corp.
General Instrument Corp., Defense Products Div.
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Photo

Clevite Transistor Products, Div.-Clevite Corp.
Terminal Radio Corp.

Point-Contact

General Instrument Corp., Defense Products Div.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Power

Bogue Electric Mfg. Co.
Clevite Transistor Products, Div.—Clevite Corp.
General Instrument Corp., Defense Products Div.
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div.
Motorola, Inc., Military Marketing Div.
Motorola Semiconductor Products Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co., Div.
Terminal Radio Corp

Selenium

General Instrument Corp., Defense Products Div.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Silicon

Bogue Electric Mfg. Co.
General Instrument Corp., Defense Products Div.
Hughes Products, Hughes Aircraft Co., Semiconductor Div.
Motorola, Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
Transitron Electronic Corp.
*WESTINGHOUSE ELECTRIC CORP.

Silicon, Power

Bogue Electric Mfg. Co.
General Instrument Corp., Defense Products Div.
Motorola, Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Surface Barrier

Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Switching

Clevite Transistor Products, Div.—Clevite Corp.
Helipot Corp.
*INTERELECTRONICS CORP.
Minneapolis-Honeywell Regulator Co., Semiconductor Products Div.
Motorola Semiconductor Products Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
Transitron Electronic Corp.

Tetrode

Minneapolis-Honeywell Regulator Co., Semiconductor Products Div.
Terminal Radio Corp.

TRANSMITTERS

Acoustica Associates, Inc.
Adler Electronics, Inc.
Advance Industries, Inc.
Amelco, Inc.
American Printed Circuits Co., Inc.
Alfred W. Barber Labs.
J. H. Bunnell & Co.
Collins Radio Co.
Communications Co.
Du Kane Corp.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
Hazeltine Electronics Div.—Hazeltine Corp.
E. F. Johnson Co.
Kaiser Aircraft & Electronics Div.—Kaiser Industries Corp.
Manson Laboratories, Inc.
Motorola, Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
National Electronics Laboratories, Inc.
Ralph M. Parsons Co., The Electronics Div.
*RADIATION, INC.
Radio Corporation of America, Defense Electronics Products
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Resdel Engrg. Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Ryan Aeronautical Co.
Sarkes Tarzian, Inc.
Skiatron Electronics & Television Corp.
Standard Electronics Div., Radio Engrg. Labs., Inc.
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Terminal Radio Corp.
United Electrodynamics, Div.—United Geophysical Corp.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

TUBE

Beaton & Corbin Mfg. Co., The
Enflo Corp.
Sylvania Electric Products, Inc., Parts Div.
Terminal Radio Corp.

Cooling Units

Collins Radio Co.
Dunham-Bush, Inc.
General Cable Corp.
Ryan Aeronautical Co.
Terminal Radio Corp.
*UNITED AIRCRAFT PRODUCTS, INC.

Pin Straighteners

Hickok Electrical Instrument Co., The
Terminal Radio Corp.

Pullers

Terminal Radio Corp.

Seal Leads

Sylvania Electric Products, Inc., Parts Div.
Terminal Radio Corp.

Shields

American Brass Co., The
Atlas E-E Corp.
Beaton & Corbin Mfg. Co., The
Connector Corp.
Elco Corp.
Gasket, Packing & Specialty Co., Inc.
General Cable Corp.
Magnetic Shield Div.—Perfection Mica Co.
Sylvania Electric Products, Inc., Parts Div.
Terminal Radio Corp.
Vector Electronic Co.
Waldom Electronics, Inc.

Sockets

Alden Products Co.
American Brass Co., The
Connector Corp.
Eitel-McCullough, Inc.
Elco Corp.
Enflo Corp.
Livingston Electronic Corp.
Mycalex Corp. of America
Sylvania Electric Products, Inc., Parts Div.
Terminal Radio Corp.
Vector Electronic Co.
Waldom Electronics, Inc.

TUBES

Burroughs Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Terminal Radio Corp.
United Electronics Co.

Atr

Bomac Laboratories, Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Backward Wave

Bendix Aviation Corp., Red Bank Div.
Geisler Labs.
Huggins Labs., Inc.
Nuclear Corp. of America, Inc.
Polarad Electronics Corp.
Terminal Radio Corp.
Wave Particle Corp.

Ballast

Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Battery Charger
Christie Electric Corp.
Gordos Corp.
Hammett Electric Co.
Terminal Radio Corp.

Balometer
Microwave Electronics Div., Sperry Gyroscope Co.
Terminal Radio Corp.

Cathode Ray
Edgerton, Germeshausen & Grier, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Ferranti Electric Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
*WESTINGHOUSE ELECTRIC CORP.

Ceramic
American Lava Corp.
Bendix Aviation Corp., Red Bank Div.
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Electrical Refractories Co., The
Geisler Labs.
Isolantite Mfg. Corp.
Polarad Electronics Corp.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.
United Electronics Co.
Wave Particle Corp.

Computer, Storage
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
National Union Electric Corp.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.

Counter Beam
Burrougs Corp.
Burroughs Corp., Electronic Tube Div.
Nuclear Corp. of America, Inc.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.

Electrometer
Ferranti Electric Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Electron Multiplier
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
National Union Electric Corp.
Terminal Radio Corp.

Gamma Ray, Nuclear
Anton Electronic Labs., Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Glow or Discharge
Amglo Corp.
Anton Electronic Labs., Inc.
Baird-Atomic, Inc.
Burroughs Corp., Electronic Tube Div.
Edgerton, Germeshausen & Grier, Inc.
Ferranti Electric Inc.
Gordos Corp.
Kemlite Laboratories, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Signalite Inc.
Terminal Radio Corp.
Veeco Vacuum Corp.

Ignitron
Beaton & Corbin Mfg. Co., The
Hammett Electric Co.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Infrared
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Infrared Industries Inc.
Kemlite Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Ionization
Amglo Corp.
Central Electronic Mfgrs., Inc.
Green Rectifier Co.
NRC Equipment Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.

Klystron
Bendix Aviation Corp., Red Bank Div.
Bomac Laboratories, Inc.
Demornay-Bonardi
Eitel-McCullough, Inc.
Ferranti Electric Inc.
Geisler Labs.
Hammett Electric Co.
Polarad Electronics Corp.
Ryan Aeronautical Co.
Terminal Radio Corp.

Magnetron
Bomac Laboratories, Inc.
Demornay-Bonardi
Ferranti Electric Inc.
Geisler Labs.
Polarad Electronics Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Miniature
Bendix Aviation Corp., Red Bank Div.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Noise Source
Bendix Aviation Corp., Red Bank Div.
Bomac Laboratories, Inc.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Central Electronic Mfgrs., Inc.
Ferranti Electric Inc.
Geisler Labs.
Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Phototubes
Central Electronic Mfgrs., Inc.
Edgerton, Germeshausen & Grier, Inc.
Electron-Radar Products
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Gordos Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Phototubes, Multiplier
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Terminal Radio Corp.

Pirani
Green Rectifier Co.
NRC Equipment Corp.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.

Power Amplifier
Bendix Aviation Corp., Red Bank Div.
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
Hammett Electric Co.
Nuclear Corp. of America, Inc.
Penta Labs, Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.
United Electronics Co.
*WESTINGHOUSE ELECTRIC CORP.

Receiving
Bendix Aviation Corp., Red Bank Div.
Eitel-McCullough, Inc.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Rectifying, Gas Filled Type
Central Electronic Mfgrs., Inc.
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Gordos Corp.
Hammett Electric Co.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.
*WESTINGHOUSE ELECTRIC CORP.

Rectifying, Transmitting
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
Hammett Electric Co.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.

Rectifying, Vacuum Type
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
Hammett Electric Co.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.
*WESTINGHOUSE ELECTRIC CORP.

Scintillation
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Scintillation, Nuclear
Radiation Counter Labs., Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Sparkgap
Bendix Aviation Corp., Red Bank Div.
Bomac Laboratories, Inc.
Edgerton, Germeshausen & Grier, Inc.
Graflex, Inc.

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Terminal Radio Corp.

Strobe

Amglo Corp.
Edgerton, Germeshausen & Grier, Inc.
Kemlite Laboratories, Inc.
Terminal Radio Corp.

Subminiature

Bendix Aviation Corp., Red Bank Div
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div
Terminal Radio Corp.

Switching

Bendix Aviation Corp., Red Bank Div
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.

Thyratron

Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Hammett Electric Co.
Penta Labs., Inc.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.

Tr

Bomac Laboratories, Inc.
Central Electronic Mfgrs., Inc.
Ferranti Electric Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Transducer

Acoustica Associates, Inc.
Crescent Engrg. & Research Co.
Polyphase Instrument Co.
Terminal Radio Corp.

Transmitting

Acoustica Associates, Inc.
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
Nuclear Corp. of America, Inc.
Ryan Aeronautical Co.
Terminal Radio Corp.
United Electronics Co.
*WESTINGHOUSE ELECTRIC CORP.

Transmitting-Receiving

Bomac Laboratories, Inc.
Terminal Radio Corp.
United Electronics Co.
*WESTINGHOUSE ELECTRIC CORP.

Traveling Wave

Bendix Aviation Corp., Red Bank Div.
Bomac Laboratories, Inc.
Demornay-Bonardi
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Geisler Labs.
Huggins Labs., Inc.
Marconi Instruments
Terminal Radio Corp.
United Electronics Co.

Ultra-Violet

Central Electronic Mfgrs., Inc.
Gordos Corp.
Kemlite Laboratories, Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Vacuum

Bendix Aviation Corp., Red Bank Div.
Burroughs Corp., Electronic Tube Div.
Eitel-McCullough, Inc.
National Union Electric Corp.
Penta Labs, Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.
*WESTINGHOUSE ELECTRIC CORP.

Voltage Reference or Regulating

Anton Electronic Labs., Inc.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Signalite Inc.
Superior Electric Co., The
Terminal Radio Corp.

X-ray

Bracke-Seib X-Ray Co., Inc.
Ferranti Electric Inc.
Instruments Div.-Philips Electronics, Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

TUBING, WAVEGUIDE

Airtron, Inc.
Allied Research & Engrg., Div.—Allied Record Mfg. Co.
American Brass Co., The
*AMERICAN MACHINE & FOUNDRY CO.
Central Electronic Mfgrs., Inc.
Chase Brass & Copper Co., Inc.
Co-Operative Industries, Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Engelhard Industries, Inc., D. E. Makepeace Div.
Goodyear Aircraft Corp.
J-V-M Microwave Co.
Metals & Controls Corp.
Microwave Development Labs., Inc.
Nuclear Corp. of America, Inc.
Superior Tube Co.
Technical Oil Tool Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Tube Methods, Inc.
Wacline, Inc.
Waveguide, Inc.

TUNERS

Airtron, Inc.
Bogart Mfg. Corp.
Diamond Antenna & Microwave Corp.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Terminal Radio Corp.

Automatic

Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
Polarad Electronics Corp.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

F-m & A-m

General Instrument Corp., Defense Products Div.
J. W. Miller Co.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Klystron

Aircom, Inc.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Empire Products Sales Corp.
Geisler Labs.
General Instrument Corp., Defense Products Div.
Narda Microwave Corp., The
Polarad Electronics Corp.
Ryan Aeronautical Co.
Telectro Indstries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.

Microwave

Aircom, Inc.
Airtron, Inc.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Electronic Communications, Inc.
Empire Products Sales Corp.
Engelhard Industries, Inc., D. E. Makepeace Div.
General Instrument Corp., Defense Products Div.
John Gombos Co., Inc.
J-V-M Microwave Co.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
Prodelin, Inc.
Radar Design Corp.
Ryan Aeronautical Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Uniwave, Inc.
Weinschel Engrg.

Permeability

General Instrument Corp., Defense Products Div.
Telectro Industries Corp.
Terminal Radio Corp.

Uhf

Bendix Aviation Corp., York Div.
Electronic Communications, Inc.
General Instrument Corp., Defense Products Div.
J-V-M Microwave Co.
Microlab
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Prodelin, Inc.
Radar Design Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Weinschel Engrg.

TUNING DEVICES

Bendix Aviation Corp., York Div.
Canoga Corp. of California
Empire Products Sales Corp.
General Instrument Corp., Defense Products Div.
General Railway Signal Co.
P. R. Mallory & Co., Inc.
Ryan Aeronautical Co.
Technical Appliance Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Uniwave, Inc.
Wilcox Electric Co., Inc.

TUNING UNITS, ANTENNA

Airtron, Inc.
Canoga Corp. of California
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
General Instrument Corp., Defense Products Div.
Microwave Electronics Div., Sperry Gyroscope Co.
Prodelin, Inc.
Ryan Aeronautical Co.
Technical Appliance Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Wilcox Electric Co., Inc.

VIBRATION CONTROLS

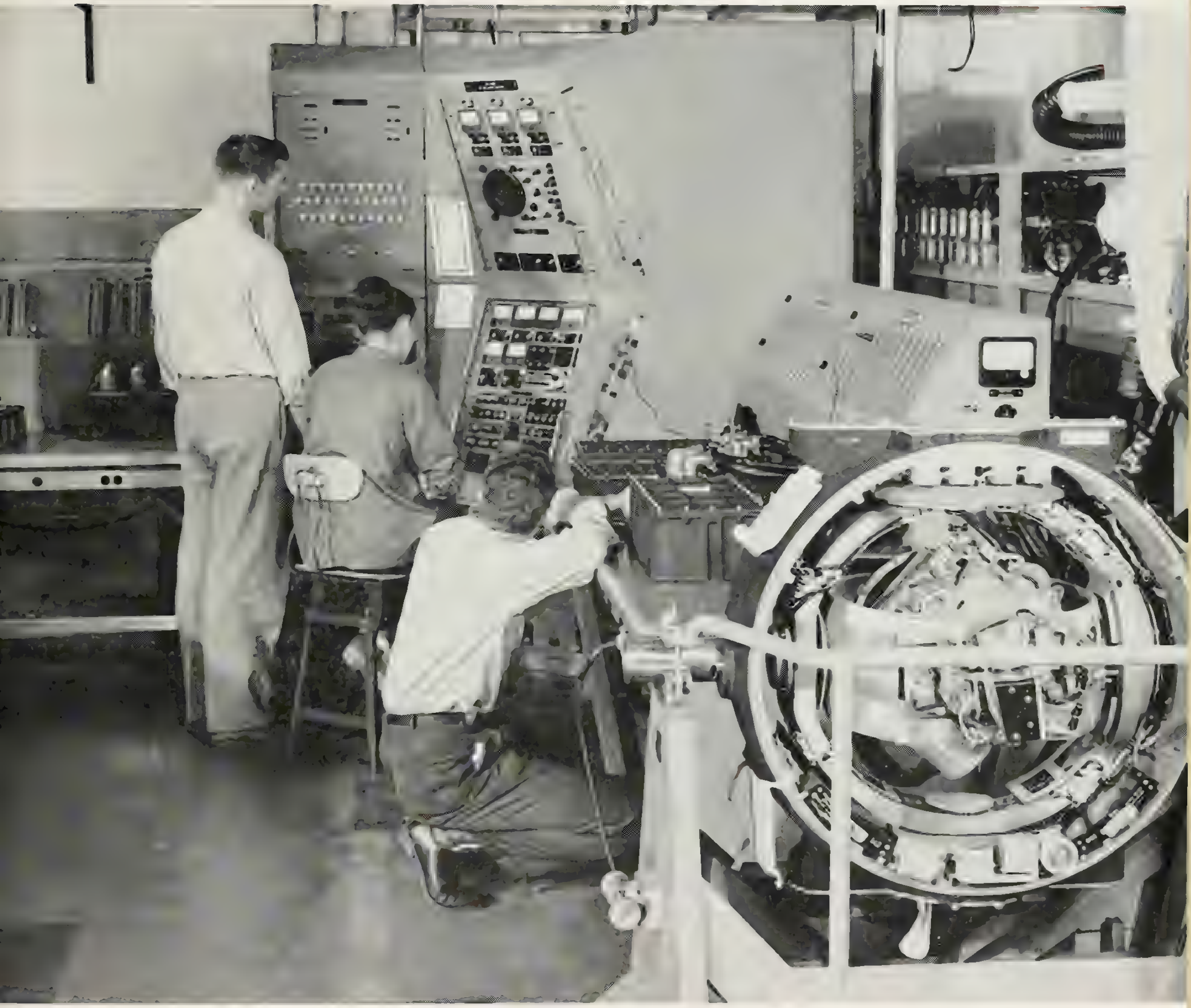
Barry Controls, Inc.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Federal Shock Mount Div.—The Korfund Co.
Finn Aeronautical Div., T. R. Finn & Co., Inc.
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Walter Kidde & Co., Inc., Aviation Div.
Massa Labs., Inc.
Robinson Aviation, Inc.
Ryan Aeronautical Co.
Terminal Radio Corp.

WINDINGS, TRANSFORMER

Advance Industries, Inc.
Advanced Electronics, Inc.
Airtron, Inc.
Associated Valve Co.
ESC Corp.
Ferranti Electric, Inc.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Johnson Electronics, Inc.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
National Coil Co.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Varo Mfg. Co.

CHECKOUT EQUIPMENT

This equipment determines prior to launching whether all portions of the missile will or will not perform as intended. It is used to check out warhead, guidance, control and propulsion systems.



STEMCO THERMOSTATS

for electronic and avionic applications

Features to fit your *special requirements* for avionic and electronic applications—from standard, production-line Stemco thermostats. That's just *part* of the Stemco story.

Because Stevens makes the widest range of bimetal thermostats in the industry, we offer an unusual number of basic design types . . . various terminal arrangements and mounting provisions . . . different temperature ranges and performance characteristics. In addition, Stemco thermostats feature small cubage, light weight and proven reliability—*at a production price.*

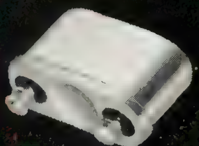
So get the Stemco story *first.* Write, call or wire *now* while your product is in the planning stage.

*Refer to Guide 400 EO for U.L. and C.S.A. approved ratings.

TYPE A*

Semi-enclosed

Insulated, electrically independent bimetal disc gives fast response and quick, snap-action control. Operation from —10° to 400°F or higher on special order. Various mountings and terminals. Rated from 4 to 13 amps at 115 volts AC, depending on service conditions; 4 amps at 230 volts AC and 28 volts DC. Bulletin 3000.



TYPE C

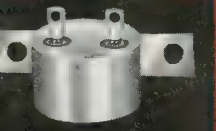
Hermetically sealed

Electrically identical to semi-enclosed Type C but sealed in crystal can. Also supplied as double thermostat "alarm" type. Turret terminals or wire leads. Bulletin 5000.

TYPE M*

Semi-enclosed

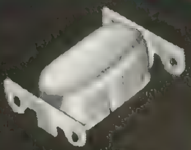
Electrically independ
bimetal disc type for
pliance and electronic
plications from —10°
350°F. Rating: 8 amps
115 volts AC, 4 amps
230 volts AC and 28 v
DC. Virtually any type
minal. Bulletin 6000.



TYPE A

Hermetically sealed

Electrically identical to semi-enclosed Type A. Temperatures from —10° to [illegible]°F. Various enclosures and mountings, including brackets, available. For [illegible] electronic, [illegible] applications. Bulletin 3000.



TYPE C

Semi-enclosed

Small, positive-acting. Electrically independent bimetal strip for operation from —10° to 300°F. Rated at approximately 3 amps, depending on application. Terminals and mountings to customer specifications. Bulletin 5000.

STEVENS *manufacturing company, inc.*

Lexington and
Mansfield, Ohio

AA-6306

STEMCO®

THERMOSTATS

TYPE M

Hermetically seal

Electrically same as s
enclosed Type M. Car
furnished with pin or sol
type terminals, wire le
and various mount
brackets. Bulletin 6000

CHECKOUT EQUIPMENT

ACCELEROMETERS

American Car & Foundry Div., ACF Industries, Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Arma Div.—American Bosch Arma Corp.
Autotron, Inc.
B & F Instruments, Inc.
Bergen Labs.
Brush Instruments, Div.—Clevite Corp.
Cadillac Gage Co.
Chesapeake Instrument Corp.
Clark Electronic Laboratories
Columbia Research Labs.
Computer Instruments Corp.
Consolidated Electrodynamics Corp.
Joe Davidson & Associates
Eclipse-Pioneer Div., Bendix Aviation Corp.
Edcliff Instruments
Elgin Micronics, West Coast Div.—Elgin National Watch Co.
Endevco Corp.
Epic, Inc.
Fairchild Controls Corp., Components Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Gray Mfg. Co., The
Greenleaf Mfg. Co., The. Div.—Mandrel Industries, Inc.
Hamilton Watch Co., Military Products Div.
Humphrey, Inc.
Kearfott Co., Inc.
***WALLACE O. LEONARD, INC.**
Massa Labs., Inc.
Miljan Div., Paul Omohundro Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Northam Electronics, Inc.
Pacific Scientific Co.
Pickering & Co., Inc.
Reeves Instrument Corp.
Sanders Associates, Inc.
Servomechanisms, Inc.
Thieblot Aviation Co., Div.—Vitro Corp. of America
Ultradyne, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.

ADAPTERS, LAMP SOCKET

Kulka Electric Corp.
Frank W. Morse Co.

ADAPTERS, PHASE

Phaostron Instrument & Electronic Co.
Varo Mfg. Co.

ALARM SYSTEMS

***AVCO MFG. CORP., CROSLEY DIV.**
Bendix Aviation Corp., York Div.
Devco Engrg., Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Fenwal, Inc.
Fischer & Porter Co.
Food Machinery & Chemical Corp., Ordnance Div.
Hallamore Electronics Co.
***KAHN & CO., INC.**
Star Engraving Co., Ltd.
Thompson-Ramo-Wooldridge Products Co., The
Tucson Instrument Corp.
Wickes Engrg. & Construction Co., Inc.

ALARMS, AUTO

Bendix Aviation Corp., York Div.
Devco Engrg., Inc.
Electric Auto-Lite Co., The
Hallamore Electronics Co.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

AMMETERS

Assembly Products, Inc.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
***ROCHESTER MFG. CO. INC.**
Simpson Electric Co.
Sun Electric Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

AMPLIFIERS

Acro Products Co.
Airborne Accessories Corp.
Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Atlantic Research Corp.
Brush Instruments, Div.—Clevite Corp.
Cedar Engrg. Div.—Control Data Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***COOPER DEVELOPMENT CORP.**
Daven Co., The
Dunlap Electronics, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Heiland Div.—Minneapolis-Honeywell
***INTERELECTRONICS CORP.**
International Research Associates
Lane Electronics Mfg. Corp.
Gerard G. Leeds Co., Inc.
L E L, Inc.
Mid-Century Instrumatic Corp.
Owen Labs., Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
United Control Corp.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

Audio Subminiature

Amelco, Inc.
***DATA-CONTROL SYSTEMS, INC.**
Daven Co., The
Du Kane Corp.
Dunlap Electronics, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Elgin Micronics, West Coast Div.—Elgin National Watch Co.
Gray Mfg. Co., The
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
***INTERELECTRONICS CORP.**
International Research Asociates
Kay Electric Co.
Lane Electronics Mfg. Corp.
La Pointe Industries, Inc.
M F Electronics Co.
Magnavox Co., The
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Roflan Co., The
Ryan Aeronautical Co.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Varo Mfg. Co.
Walkirt Co.
Westbury Electronics, Inc.
Western Electro-Acoustic Lab.

Booster

Adler Electronics, Inc.
Amelco, Inc.
Daven Co., The
Du Kane Corp.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Haller Raymond & Brown, Inc.
International Research Associates
Minneapolis-Honeywell Regulator Co., Boston Div.
George A. Philbrick Researches, Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Western Electro-Acoustic Lab.
Winder Aircraft Corp. of Fla.

Cathode Followers

Allegany Instrument Co., Inc.
Amelco, Inc.
Bendix Aviation Corp., York Div.
Columbia Research Labs.
***COOPER DEVELOPMENT CORP.**
***DATA-CONTROL SYSTEMS, INC.**
Daven Co., The
Dunlap Electronics, Inc.
Electronic Associates, Inc.
Elgin Micronics, West Coast Div.—Elgin National Watch Co.
Haller Raymond & Brown, Inc.
International Research Associates
Keithley Instruments, Inc.
Orbitran Co., Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Western Electro-Acoustic Lab.

Data Recording

Advance Industries, Inc.
Amelco, Inc.
American Electronics, Inc.
Baird-Atomic, Inc.
Brush Instruments, Div.—Clevite Corp.
Centronix, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS, INC.**
Daytronic Corp.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
Hanson-Gorrill-Brian, Inc.
Heiland Div.—Minneapolis-Honeywell
***INTERELECTRONICS CORP.**
Kin Tel Div.—Cohu Electronics, Inc.
Magnasync Mfg. Co., Ltd.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Moran Instrument Corp.
Philco Corp., Government & Industrial Divs.
Photron Instrument Co.
Reeves Instrument Corp.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Western Electro-Acoustic Lab.
Winder Aircraft Corp. of Fla.

Decade, Audio

Acton Laboratories, Inc.
Amelco, Inc.
Ballantine Labs., Inc.
Daven Co., The
Dunlap Electronics, Inc.
Haller Raymond & Brown, Inc.
***INTERELECTRONICS CORP.**
Owen Labs., Inc.
Philco Corp., Government & Industrial Divs.
Herman Hosmer Scott, Inc.
Southewestern Industrial Electronics Co.
Telectro Industries Corp.
Westbury Electronics Inc.
Western Electro-Acoustic Lab.
Winder Aircraft Corp. of Fla.

PHOTO ON CHECKOUT EQUIPMENT DIVIDER PAGE: Elaborate test equipment is required to check out inertial guidance systems before shipment to the customer. This picture is of AC Spark Plug's Division of GM in Milwaukee.

. . . checkout

Differential

Allegany Instrument Co., Inc.
American Research & Mfg. Corp.
Atlantic Research Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Du Kane Corp.
Electro Instruments, Inc.
Electronic Associates, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Epsco Inc.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
Kin Tel Div.-Cohu Electronics, Inc.
Lumen, Inc.
Mid-Century Instrumatic Corp.
Offner Electronics Inc.
Philco Corp., Government & Industrial Divs.
Process & Instruments
Reeves Instrument Corp.
Resdel Engrg. Corp.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Trans Electronics, Inc.
United Control Corp.

Direct Current

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Boonton Electronics Corp.
Brush Instruments, Div.-Clevite Corp.
Computer Engrg. Associates, Inc.
Consolidated Airborne Systems, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS INC.**
Du Kane Corp.
Electro Instruments, Inc.
Epsco Inc.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics Inc.
Philco Corp., Government & Industrial Divs.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Ryan Aeronautical Co.
Sanborn Co.
Saratoga Industries
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Trans Electronics, Inc.
United Control Corp.
Westbury Electronics Inc.

Microphone

Brush Instruments, Div.-Clevite Corp.
Du Kane Corp.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Magnasync Mfg. Co., Ltd.
J. A. Maurer, Inc.
Philco Corp., Government & Industrial Divs.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Western Electro-Acoustic Lab.

Mobile

Brush Instruments, Div.-Clevite Corp.
Haller Raymond & Brown Inc.
Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Telectro Industries Corp.

Monitoring R-F

Centronix Inc.
Entron, Inc.
Haller Raymond & Brown Inc.
Polarad Electronics Corp.
Telectro Industries Corp.

Operational

Airborne Instruments Lab., Inc.
American Research & Mfg. Corp.
Computer Engrg. Associates, Inc.
***COOPER DEVELOPMENT CORP.**
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Keithley Instruments, Inc.
Lumen, Inc.
Mid-Century Instruments Corp.
Minneapolis-Honeywell Regulator Co., Boston Div.
George A. Philbrick Researches, Inc.
Polarad Electronics Corp.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Oscilloscope

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
American Electronic Labs., Inc.
Centronix Inc.
Daytronic Corp.
Dunlap Electronics, Inc.
Haller Raymond & Brown Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Gerard G. Leeds Co., Inc.
Offner Electronics Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
United Control Corp.

Peak Limiting

American Research & Mfg. Corp.
Daven Co., The
Haller Raymond & Brown Inc.
Lumen, Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Wilcox Electric Co., Inc.

Power

Acton Laboratories Inc.
Advance Industries, Inc.
Airborne Accessories Corp.
Amelco, Inc.
American Research & Mfg. Corp.
Amplifier Corp. of America
Consolidated Airborne Systems, Inc.
***DATA-CONTROL SYSTEMS INC.**
Du Kane Corp.
Electronic Asembly Co., Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Fairfield Engineering Corp.
Gray Mfg. Co., The
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hanson-Gorrill-Brian, Inc.
***INTERELECTRONICS CORP.**
Gerard G. Leeds Co., Inc.
George A. Philbrick Researches, Inc.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Saratoga Industries
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.
Winder Aircraft Corp. of Fla.

Power, Special Service

Advance Industries, Inc.
Amelco, Inc.
American Research & Mfg. Corp.
Baird-Atomic, Inc.
***DATA-CONTROL SYSTEMS INC.**
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
International Research Associates
Lumen, Inc.
J. A. Maurer, Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Winder Aircraft Corp. of Fla.

Stabilizing

Amelco, Inc.
American Research & Mfg. Corp.
Entron, Inc.
Haller Raymond & Brown Inc.
George A. Philbrick Researches, Inc.
Photron Instrument Co.
Polyphase Instrument Co.
Reeves Instrument Corp.
Southwestern Industrial Electronics Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.

Strain Gage

Allegany Instrument Co., Inc.
Amelco, Inc.
American Research & Mfg. Corp.
Baird-Atomic, Inc.
Boonton Electronics Corp
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Columbia Research Labs.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS INC.**
Daytronic Corp.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Epsco Inc.
Gilmore Industries Inc.
Hagan Chemicals & Controls, Inc.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Heiland Div.—Minneapolis-Honeywell
Industrial Control Co.
North Atlantic Industries, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Lumen, Inc.
M F Electronics Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics Inc.
Owen Labs., Inc.
Photron Instrument Co.
Sanborn Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Wideband, Audio

Acton Laboratories Inc.
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Atlantic Research Corp.
Daven Co., The
Dunlap Electronics, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Geisler Labs.
General R-F Fittings, Inc.
Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
MB Mfg. Co.
Magnavox Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Ryan Aeronautical Co.
Herman Hosmer Scott, Inc.
Seeburg Corp., The
Southwestern Industrial Electronics Co.
Standard Electronics Div., Radio Engrg. Labs. Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Western Electro-Acoustic Lab.
Wilcox Electric Co., Inc.

Wideband, R-F

Adler Electronics, Inc.
Advance Industries, Inc.
Alfred Electronics
Amelco, Inc.
Arenberg Ultrasonic Laboratory, Inc.
***AVCO MFG. CORP., CROSLEY DIV.**
Bergen Labs.
Daven Co., The
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Entron, Inc.
General R-F Fittings, Inc.
Goodyear Aircraft Corp.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Instruments For Industry, Inc.
J-V-M Microwave Co.
L E L, Inc.
Polarad Electronics Corp.
***RADIATION, INC.**
Reeves Instrument Corp.
Resdel Engrg. Corp.
Seeburg Corp., The
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Wave Particle Corp.
Westbury Electronics Inc.
Wilcox Electric Co., Inc.

ANALYSIS EQUIPMENT, ELECTRO-CHEMICAL

Ainslie Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Applied Research Labs.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Devco Engrg. Inc.
Greenbrier Instruments Inc.
Librascope Inc.
Miton Roy Co.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Sun Electric Corp.

ANALYZERS

Advance Industries, Inc.
Allegany Instrument Co., Inc.
BJ Electronics, Borg-Warner Corp.
Barnes Development Co.
Benson-Lehner Corp.

Bogue Electric Mfg., Co.
Brush Instruments, Div.-Clevite Corp.
Consolidated Electrodynamics Corp.
Dit-Mco, Inc., Electronics Div.
Dynac, Inc.
Fenske Fedrick & Miller Co.
Lear, Inc., Grand Rapids Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Milton Roy Co.
Perkin-Elmer Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
Ultradyne, Inc.

Antenna Pattern

Airborne Instruments Lab., Inc.
Antlab Inc.
Bendix Aviation Corp., York Div.
California Technical Industries, Div.-Textron Inc.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Haller Raymond & Brown Inc.
Leeds & Northrup Co.
Polarad Electronics Corp.
Scientific-Atlanta, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Audio, Amplifier

Brush Instruments, Div.-Clevite Corp.
Dunlap Electronics, Inc.
Gray Mfg. Co., The
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Ryan Aeronautical Co.
Herman Hosmer Scott, Inc.
Telectro Industries Corp.
Western Electro-Acoustic Lab.

Cable

Bogue Electric Mfg., Co.
California Technical Industries, Div.-Textron Inc.
James Cunningham Son & Co., Inc.
Dit-Mco, Inc., Electronics Div.
Electric Auto-Lite Co., The
Industrial Instruments Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Radar Engineers
Telectro Industries Corp.

Coincidence

Baird-Atomic, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Crystal

Barnes Development Co.
Kay Electric Co.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

Dimensional

Cleveland Instrument Co.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.
Telectro Industries Corp.

Distortion

Boonton Electronics Corp.
Brush Instruments, Div.-Clevite Corp.
Empire Products Sales Corp.
Marconi Instruments
Panoramic Radio Porducts, Inc.
Telectro Industries Corp.

Electro-Chemical

Consolidated Electrodynamics Corp.
Devco Engrg. Inc.
Greenbrier Instruments Inc.
Milton Roy Co.
Sun Electric Corp.
Telectro Industries Corp.

Engine

Air Logistics Corp.
Consolidated Avionics Corp.
Electro Products Labs., Inc.
Sun Electric Corp.
Telectro Industries Corp.

Frequency

Acromag Inc.
Adler Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Brush Instruments, Div.-Clevite Corp.
James Cunningham Son & Co., Inc.
Dunlap Electronics, Inc.
Dynac, Inc.
Edin Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Electric Co., Apparatus Sales Div.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Sun Electric Corp.
Systron Corp.
Telectro Industries Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Ignition

Allegany Instrument Co., Inc.
Scintilla Div., Bendix Aviation Corp.
Sun Electric Corp.
Telectro Industries Corp.

Intermodulation

Audio Instrument Co. Inc.
Empire Products Sales Corp.
Panoramic Radio Products, Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Magnetic

Advance Industries, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
General Electric Co., Apparatus Sales Div.
Lumen, Inc.
Rese Engrg., Inc.
Telectro Industries Corp.
Varo Mfg. Co.

Microwave

Airtron, Inc.
Bendix Aviation Corp., York Div.
California Technical Industries, Div.-Textron Inc.
Chemalloy Electronics Corp.
Demornay-Bonardi
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kay Electric Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
Ryan Aeronautical Co.
Stavid Engrg., Inc.
Technical Oil Tool Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.

Neutron Absorption

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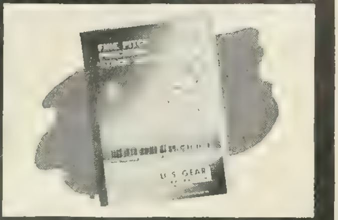

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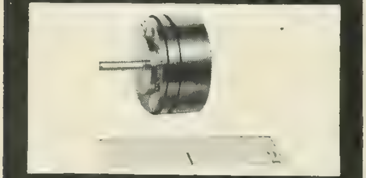

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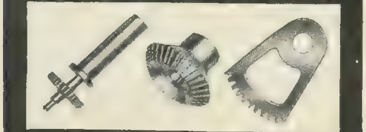

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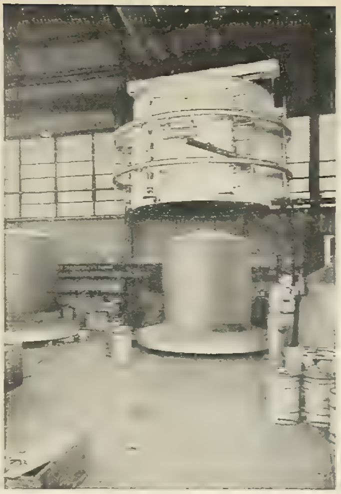

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Electric Auto-Lite Co., The, Wire & Cable Div.
Glassco Instrument Co.
__*KAHN & CO., INC.__
Jas. P. Marsh Corp.

Compression

Daytronic Corp.
Dynamic Instrument Co., Inc.
Glassco Instrument Co.
Servonic Instruments, Inc.
U. S. Gauge Div., American Machine & Metals, Inc.

Differential Pressure

Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Daytronic Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ellison Draft Gage Co.
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp.
Gilmore Industries Inc.
Glassco Instrument Co.
Hagan Chemicals & Controls, Inc.
E. Vernon Hill & Co.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
__*WALLACE O. LEONARD, INC.__
Scientific Instrument Co.
Servonic Instruments, Inc.
Trimount Instrument Co.
Ultradyne, Inc.
U. S. Gauge Div., American Machine & Metals, Inc.

Strain

Baird-Atomic, Inc.
Columbia Research Labs.
Consolidated Avionics Corp.
Daytronic Corp.
Dynamic Instrument Co., Inc.
Gilmore Industries Inc.
Gulton Industries, Inc.
Industrial Control Co.

Suction

Consolidated Controls Corp.
Dynamic Instrument Co., Inc.
Ellison Draft Gage Co.
Northam Electronics, Inc.
__*ROCHESTER MFG. CO. INC.__
U. S. Gauge Div., American Machine & Metals, Inc.

Tension

Columbia Research Labs.
Daytronic Corp.
Dynamic Instrument Co., Inc.
Gilmore Industries Inc.

Thickness, Electronic

Branson Instruments, Inc.
Cleveland Instrument Co.
Consolidated Avionics Corp.
Daytronic Corp.
J. W. Dice Co.
General Electric Co., Apparatus Sales Div.
Gulton Industries, Inc.
Photocon Research Products

Torque Pressure

Consolidated Controls Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Gilmore Industries Inc.
U. S. Gauge Div., American Machine & Metals, Inc.

Ultrasonic Thickness

Alcar Instruments, Inc.
Branson Instruments, Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
__*KAHN & CO., INC.__
Photocon Research Products

GAUSSMETERS

Hickok Electrical Instrument Co., The
Librascope Inc.
Perkin-Elmer Corp.

HYDROMETERS

General Scientific Equipment Co.
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
George L. Nankervis Co.
Scientific Instrument Co.

INDICATORS

Advance Industries, Inc.
Advanced Products Co., The
Barnes Development Co.
Barton Instrument Corp.
Brunswick Instruments
Dynac, Inc.
Electric Auto-Lite Co., The
Electro-Measurements Inc.
Ellison Draft Gage Co.
Epic, Inc.
__*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
General Railway Signal Co.
Hamilton Watch Co., Military Products Div.
__*A. W. HAYDON CO., THE__
Haydon Div.-General Time Corp.
__*KAHN & CO., INC.__
Leeds & Northrup Co.
Jas. P. Marsh Corp.
Milman Engrg. Co.
Reeves Instrument Corp.
Milton Roy Co.
__*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.__
U. S. Gauge Div., American Machine & Metals, Inc.
Wacline, Inc.

Capacitor Leakage

American Electronics, Inc.
Barnes Development Co.
Consolidated Airborne Systems, Inc.
Peschel Electronics, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America

Data Display

Bendix Aviation Corp., York Div.
Bowmar Instrument Corp.
Consolidated Electrodynamics Corp.
Dynametrics Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Farnsworth Electronics Co., Div.-Int'l. Telephone & Telegraph Corp.
Feedback Controls, Inc.
Fischer & Porter Co.
General Railway Signal Co.
Gilmore Industries Inc.
Hogan Laboratories, Inc.
Master Specialties Co.
__*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.__
Non-Linear Systems Inc.
North Atlantic Industries, Inc.
Potter Aeronautical Corp.
Reeves Instrument Corp.
Shannon Luminous Materials Co.
Soroban Engrg., Inc.
Star Engraving Co., Ltd.
__*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.__
Wacline, Inc.

Detonation Indicators & Meters

Electro Products Labs., Inc.

Deviation

Consolidated Airborne Systems, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Hickok Electrical Instrument Co., The
Varo Mfg. Co.

Dew Point

Electron-Radar Products
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
Instruments Corp., The
__*KAHN & CO., INC.__
Milton Roy Co.
Scientific Instrument Co.
Wells Industries Corp.

Dielectric Constant

Consolidated Airborne Systems, Inc.

Dive Angle

General Electric Co., Apparatus Sales Div.

Engine Synchronizer

Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.

Film Thickness

J. W. Dice Co.
Photobell Co., Inc.
Photocon Research Products

Fluid Conductivity

Barton Instrument Corp.
Consolidated Airborne Systems, Inc.
Hickok Electrical Instrument Co., The
Industrial Instruments Inc.

Fluid Flow, Electronic

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Barton Instrument Corp.
Fischer & Porter Co.
__*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.__
Gilmore Industries Inc.
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
George L. Nankervis Co.
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautical Corp.
Victory Engineering Corp.
Wacline, Inc.

Frequency

Boonton Electronics Corp.
Computer-Measurements Corp.
Consolidated Airborne Systems, Inc.
Dunlap Electronics, Inc.
Dynac, Inc.
Erie Resistor Corp.
General Electric Co., Apparatus Sales Div.
Master Specialties Co.
August E. Miller Laboratories
Skiatron Electronics & Television Corp.
Systron Corp.
Varo Mfg. Co.
Wacline, Inc.
Westronics Inc.

Fuel Flow Rate

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Avien, Inc.
Barton Instrument Corp.
Brooks Rotameter Co.
Computer-Measurements Corp.
Dynac, Inc.

checkout

Dynametrics Corp.
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS**
General Electric Co., Apparatus Sales Div.
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
***WALLACE O. LEONARD, INC.**
W. L. Maxson Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.
Systron Corp.

Fuel Mixture

Acoustica Associates, Inc.
Barton Instrument Corp.
***WALLACE O. LEONARD, INC.**

Liquid Level, Electronics

Acoustica Associates, Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Auburn Spark Plug Co., Inc.
Barton Instrument Corp.
Consolidated Airborne Systems, Inc.
Crescent Engrg. & Research Co.
Dynamics Corp
Electro-Tech Equipment Co.
Gilmore Industries Inc.
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
Liquidometer Corp., The
W. L. Maxson Corp., The
Narda Ultrasonics Corp., The
***PENBERTHY MFG. CO.**
Photobell Co., Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Simmonds Aerocessories, Inc.
Trimount Instrument Co.
Victory Engineering Corp.

Pressure

Barton Instrument Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Ellison Draft Gage Co.
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gilmore Industries Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hagan Chemicals & Controls, Inc.
E. Vernon Hill & Co.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Leeds & Northrup Co.
***WALLACE O. LEONARD, INC.**
Northam Electronics, Inc.
Photocon Research Products
Pioneer-Central Div., Bendix Aviation Corp.
***ROCHESTER MFG. CO. INC.**
Systron Corp.
Trimount Instrument Co.
Ultradyne, Inc.
U. S. Gauge Div., American Machine & Metals, Inc.

Pulse Time Riser

ESC Corp.

Radiation

American Electronics, Inc.
Baird-Atomic, Inc.
General Electric Co., Apparatus Sales Div.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Moran Instrument Corp.

Radiation, Nuclear

American Electronics, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Curtiss-Wright Corp., Electronics Div.
Jordan Electronics, Div.-Victoreen Instrument Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Radiation Instrument Development Laboratory, Inc.

Recording Engine

***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Telectro Industries Corp.

Remote

Advance Industries, Inc.
Bowmar Instrument Corp.
Brooks Rotameter Co.
Dynametrics Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Feedback Controls, Inc.
***A. W. HAYDON CO., THE**
Kearfott Co., Inc.
Kollsman Instrument Corp. Sub.-Standard Coil Products Co. Inc.
Milman Engrg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
North Atlantic Industries Inc.
***UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.**
Varo Mfg. Co.
Wacline, Inc.

RF Probe

Boonton Electronics Corp.
Kay Electric Co.
Wacline, Inc.

Timing

Advanced Products Co., The
Bergen Labs.
Bowmar Instrument Corp.
M. Ducommun Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Wacline, Inc.

Vacuum

Amthor Testnig Instrument Co., Inc.
Columbia Research Labs
Consolidated Electrodynamics Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Ellison Draft Gage Co.
Green Rectifier Co.
High Vacuum Equipment Corp.
Gerard G. Leeds Co., Inc.
NRC Equipment Corp.
Process & Instruments
***ROCHESTER MFG. CO. INC.**
U. S. Gauge Div., American Machine & Metals, Inc.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.

Vibration

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Atlantic Research Corp.
Consolidated Electrodynamics Corp.
Electro Products Labs., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Epic, Inc.
Gilmore Industries Inc.
Kay Electric Co.
MB Mfg. Co.
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Western Electro-Acoustic Lab.

Volume

Acoustica Associates, Inc.
Daven Co., The
Dynametrics Corp.
Fischer & Porter Co.
Hickok Electrical Instrument Co., The
Simmonds Aerocessories, Inc.

Weight

Crescent Engrg. & Research Co.
Curtiss-Wright Corp., Electronics Div.
Dynametrics Corp.
Gilmore Industries Inc.
Hickok Electrical Instrument Co., The
Hoover Electronics Co.
Leeds & Northrup Co.

Wind Direction

Beckman & Whitley, Inc.
Friez Instrument Div.-Bendix Aviation Corp.
E. Vernon Hill & Co.
Instruments Corp., The
Scientific Instrument Co.
Security Parachute Co.
Victory Engineering Corp.

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Barnes Development Co.
Crescent Engrg. & Research Co.
Telectro Industries Corp.
United Transformer Corp.

INSPECTION EQUIPMENT

American Optical Co., Instrument Div.
Baird-Atomic, Inc.
Blowers Inc.
Cleveland Instrument Co.
Engrg. Developments, Inc.
Hallamore Electronics Co.
Lane Electronics Mfg. Corp.
Strat-O-Seal Mfg. Co.

Fluorescent

Day-Ray Products, Inc.
Engrg. Developments, Inc.
Research, Inc.
Strat-O-Seal Mfg. Co.
United States Radium Corp.

Lighting

Blowers Inc.
Chicago Miniature Lamp Works
Day-Ray Products, Inc.
Engrg. Developments, Inc.
Grimes Mfg. Co.
Shannon Luminous Materials Co.

Magnetic

***BAUSCH & LOMB OPTICAL CO.**
Electric Eye Equipment Co.
Hallamore Electronics Co.

Optical

American Optical Co., Instrument Div.
Baird-Atomic, Inc.
Davidson Mfg. Co.
Eastman Kodak Co.
Electric Eye Equipment Co.
Engrg. Developments, Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
***OPTO-METRIC TOOLS, INC.**

X-Ray

Bracke-Seib X-ray Co., Inc.
Instruments Div.-Philips Electronics, Inc.
Sheffield Corp., The, Sub.—Bendix Aviation Corp
***WESTINGHOUSE ELECTRIC CORP.**

LINES, SLOTTED

Aircom Inc.
California Technical Industries, Div.-Textron Inc.
Defiance Engrg. & Microwave Corp.
Demornay Bonardi
Diamond Antenna & Microwave Corp.
Industrial Engravers Inc.
Omega Labs., Inc.
Radar Design Corp.
Sage Laboratories, Inc.
Sohl Co., The
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Uniwave, Inc.
Wacline, Inc.
Westbury Electronics Inc.

MACHMETERS

Dynametrics Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Pioneer-Central Div., Bendix Aviation Corp.
M. Ten Bosch, Inc.

MAGNETIC ANALYSIS EQUIPMENT

J. W. Dice Co.
Librascope Inc.

MANOMETERS

Calcor Corp., Aircraft Div.
Consolidated Electrodynamics Corp.
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp.
Green Rectifier Co.
E. Vernon Hill & Co.
Scientific Instrument Co.
Strata Instrument Co.
Trimount Instrument Co.

MEASURING EQUIPMENT, PRESSURE

Allegany Instrument Co., Inc.
Barton Instrument Corp.
Brush Instruments, Div.-Clevite Corp.
Consolidated Avionics Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Decker Corp., The
Dynametrics Corp.
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Heiland Div.—Minneapolis-Honeywell

E. Vernon Hill & Co.
Ideal-Aerosmith, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Moisture Register Co.
George L. Nankervis Co.
Photocon Research Products
Scientific Instrument Co.
Servonic Instruments, Inc.
Sun Electric Corp.
Systron Corp.
U. S. Gauge Div., American Machine & Metal, Inc.
Victory Engineering Corp.

MEASURING EQUIPMENT, VIBRATION

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Brush Instruments, Div.-Clevite Corp.
Columbia Research Labs.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Davidson Mfg. Co.
General Electric Co., Apparatus Sales Div.
Heiland Div.—Minneapolis-Honeywell
***KAHN & CO., INC.**
Kay Electric Co.
MB Mfg. Co.
Massa Labs., Inc.
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Systron Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.

MEASURING EQUIPMENT, VSWR

Aircom Inc.
Airtron, Inc.
Browning Laboratories, Inc.
California Technical Industries, Div.-Textron Inc.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Demornay-Bonardi
Geisler Labs.
E. F. Johnson Co.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Omega Labs., Inc.
Radar Design Corp.
Telectro Industries Corp.
Wave Particle Corp.

MEGOHMETERS, VACUUM TUBE

Associated Research, Inc.
Consolidated Airborne Systems, Inc.
Curtiss-Wright Corp., Electronics Div.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Gerard G. Leeds Co., Inc.
Precision Apparatus Co., Inc.
***RHEEM MFG. CO., ELECTRONICS DIV.**

METERS

Advanced Products Co., The
Airtron, Inc.
Alto Scientific Co., Inc.
Amerac Inc.
Assembly Products, Inc.
Barnes Development Co.
Barton Instrument Corp.
Boonton Radio Corp.
Burroughs Corp.
Consolidated Electrodynamics Corp.
Daven Co., The
Davenport Mfg. Co.
Dejur-Amsco Corp.
Dynac, Inc.
Electro-Tech Equipment Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geartronics Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Hickok Electrical Instrument Co., The
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Meters Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
U. S. Gauge Div.-American Machine & Metals Inc.
Wacline, Inc.

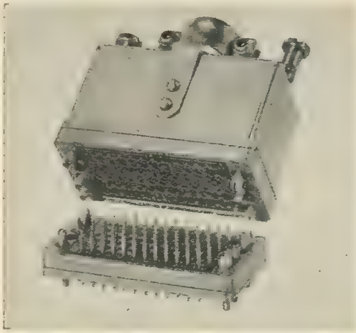
Ammeter

American Metrix Corp.
***ANTON ELECTRONIC LABS., INC.**
Assembly Products, Inc.
Davenport Mfg. Co.
Dejur-Amsco Corp.

NEW COMPONENTS FOR MAXIMUM RELIABILITY DESIGNED FOR MISSILE, AIRBORNE, MILITARY, INDUSTRIAL ELECTRONIC CIRCUITS AND SYSTEMS

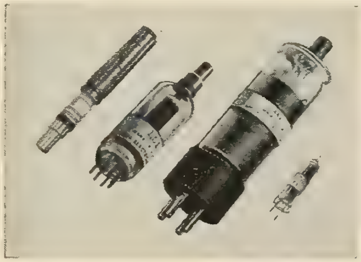
Integrated design and development program leads to production of an improved series of multipin connectors and ruggedized corona discharge V-R tubes.

Based upon suggestions of design and specification engineers of leading companies in the missile, airborne, military and industrial electronics field, new designs meet reliability demands of actual field requirements.



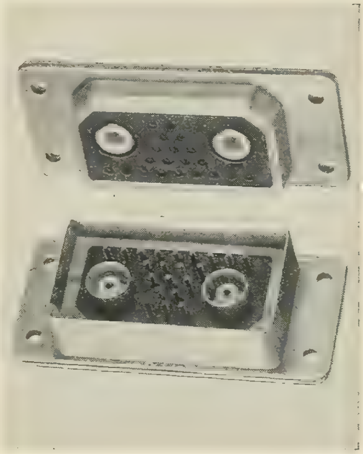
Equipment connector designers and components specification engineers have been encouraged by the development of a new reliable and rugged connector series. This Anton Series WM20 eliminates molding breakage conventionally encountered because of screw-lock and guide pin strain as well as mounting lip damage. It is interchangeable with existing Specification MIL-C-8384 types and is available for front or flush mounting applications.

Reliability and ruggedness of this Anton WM20 series results from a unique design improvement which incorporates the guide pins and screw-lock as part of a die-cast aluminum housing. This restricts all locking force and strain to the metal shell. It provides insurance against obvious as well as hidden strain cracks. Mounting lip breakage is done away with by elimination of the plastic mounting lip in the latest Anton connector development. The connector also incorporates body float which helps eliminate alignment problems. This greatly improves reliability in applications where vibration is encountered.



You can now achieve precise voltage regulation for low current application over a range from 400 volts to 30 KV in a reliable, inexpensive, simple and straightforward manner—the use of Anton Corona Discharge Voltage Regulator tubes. Over 500,000 Anton Corona V-R tubes have been used successfully for stabilizing power supplies or as voltage reference tubes in the field of radiac, missile and airborne electronics. Tubes are available ranging in size from subminiature to standard.

To help design and specification engineers determine whether their high voltage low current regulation problems can be solved economically, Anton Electronic Laboratories will send a free reprint of a theoretical and practical dissertation, "Corona Discharge V-R Tubes", upon request.



High and low voltage plus high and low current connections are provided in a single unit by Anton's Series "S-20" connectors. This same series also provides designs which combine coaxial and standard contacts. Space-saving, moisture-proof and strength qualities have also been designed into this new "S" series. The dominant feature is a single molding (Standard Diallyl Phthalate) in each half of the connector. This eliminates "moisture trap" usually found in old style two-piece moldings.

Considerable shut-height space is conserved by a unique counter-sunk mating design. Pins are completely protected. There is positive shell polarization and alignment. The molding is housed in a precision die-cast, irridited aluminum shell. This shell protects, mounts and aligns the connector. For test and trouble shooting convenience, plug and socket can remain "live" when disconnected because the shell also serves to prevent the accidental short circuiting of pins when plug is in open position.

PLEASE VISIT US OR WRITE

All Anton components can be seen at our plant. When you visit New York, you are cordially invited to relax and discuss your component needs with our engineers. But don't wait till then. Write Dept. MR for free, complete data — NOW — on all of Anton's special electronic components.

ANTON

ANTON ELECTRONIC LABORATORIES, INC.

A subsidiary of United States Hoffman Machinery Corporation
1226 FLUSHING AVE., BROOKLYN 37, N. Y.

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Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
***ROCHESTER MFG. CO. INC.**
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Ammeter R-F

Alto Scientific Co., Inc.
Assembly Products, Inc.
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Phaostron Instrument & Electronic Co.
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
U. S. Gauge Div., American Machine & Metals Inc.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Attenuation

Alto Scientific Co., Inc.
Daven Co., The
Demornay-Bonardi
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Termnial Radio Corp.

Audio

Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Ryan Aeronautical Co.
Sun Electric Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Cable Testing

Associated Research, Inc.
Barnes Development Co.
California Technical Industries, Div.-Textron Inc.
Davenport Mfg. Co.
Hammet Electric Co.
Instrument Laboratories
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Peschel Electronics, Inc.
Terminal Radio Corp.

Capacitance

Barnes Development Co.
Boonton Electronics Corp.
Consolidated Airborne Systems, Inc
Electro-Tech Equipment Co.
Epic, Inc.
Hammett Electric Co.
Industrial Instruments Co.
Gerard G. Leeds Co., Inc.
Precision Apparatus Co., Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Conductance

Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Counting Rate

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Dynac, Inc.
Erie Resistor Corp.
Hammett Electric Co.
I-L-S Instrument Corp.
Gerard G. Leeds Co., Inc.
Potter Aeronautical Corp.
Radiation Counter Labs., Inc.
Simpson Electric Co.
Systron Corp.
Terminal Radio Corp.
Walkirt Co.

Counting Rate, Nuclear

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Radiation Counter Labs., Inc.
Systron Corp.
Terminal Radio Corp.

D Arsonval

Assembly Products, Inc.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
General Electric Co. Apparatus Sales Div.
Hammett Electric Co.
Leeds & Northrup Co.
Meters Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Terminal Radio Corp.
Wacline, Inc.

Decibel

Boonton Electronics Corp.
Chesapeake Instrument Corp.
Dejur-Amsco Corp.
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Instrument Laboratories
Gerard G. Leeds Co., Inc.
Meters Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Herman Hosmer Scott, Inc.
Simpson Electric Co.
Terminal Radio Corp.
Wacline, Inc.

Deflection

Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Owen Labs., Inc.
Terminal Radio Corp.

Deviation

Barnes Development Co.
Computer-Measurements Corp.
Consolidated Airborne Systems, Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Marconi Instruments
Minneapolis-Honeywell Regulator Co., Indust. Div.
Terminal Radio Corp.
Varo Mfg. Co.

Distortion & Noise

Airborne Instruments Lab., Inc.
Boonton Electronics Corp.
Electro-Tech Equipment Co.
Empire Products Sales Corp.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Ryan Aeronautical Co.
Terminal Radio Corp.
Western Electro-Acoustic Lab.

Dosimeter

***AMERICAN MACHINE & FOUNDRY CO.**
***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Cambridge Instrument Company, Inc.
Hammett Electric Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Dosimeter, Nuclear

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Cambridge Instrument Company, Inc.
Computer-Measurements Corp.
Hammett Electric Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Elapsed Time

Advanced Products Co., The
***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Bergen Labs.
Burroughs Corp.
Dejur-Amsco Corp.
Dynac, Inc.
Eldorado Electronics
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div. Elgin National Watch Co.
Epic, Inc.
Erie Resistor Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
***A. W. HAYDON CO., THE**
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Simpson Electric Co.
Systron Corp.
Terminal Radio Corp.
Wacline, Inc.

Electrometer

Cambridge Instrument Company, Inc.
Curtiss-Wright Corp., Electronics Div.
Hallikainen Instruments
Hammett Electric Co.
Keithley Instruments, Inc.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Nuclear-Chicago Corp.
Terminal Radio Corp.
Wacline, Inc.

Electronic Micrometer

Alpha Instrument Co.
Cleveland Instrument Co.
Computer-Measurements Corp.
Consolidated Avionics Corp.
Daytronic Corp.
Decker Corp., The
J. W. Dice Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Events-Per-Unit-Time

Advanced Products Co., The
Baird-Atomic, Inc.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Computer-Measurements Corp.
Dunlap Electronics, Inc.
Dynac, Inc.
Eldorado Electronics
Erie Resistor Corp.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Potter Aeronautical Corp.
Radiation Counter Labs., Inc.
Systron Corp.
Terminal Radio Corp.
Walkirt Co.

Flow

Baird-Atomic, Inc.
Barton Instrument Corp.
Brooks Rotameter Co.
Fischer & Porter Co.
Hagan Chemicals & Controls, Inc.
Hallikainen Instruments
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
George L. Nankervis Co.
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.
Systron Corp.
Terminal Radio Corp.
Trimount Instrument Co.
Waugh Engrg. Co.

Flutter

Amplifier Corp. of America
Barton Instrument Corp.
D & R, Ltd.
Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Telectro Industries Corp.
Terminal Radio Corp.

Flux

Cambridge Instrument Company, Inc.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

FM Deviation

Browning Laboratories, Inc.
***DATA-CONTROL SYSTEMS INC.**
Gertsch Products Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Footcandle

Computer-Measurements Corp.
Electro-Tech Equipment Co.
Hammett Electric Co.
Terminal Radio Corp.

Frequency

Acromag Inc.
Aircom Inc.
Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
James G. Biddle Co.
Burroughs Corp., Electronic Tube Div.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Dunlap Electronics, Inc.
Dynac, nlc.
Electro Impulse Lab., Inc.
Electro-Tech Equipment Co.
Epic, Inc.
Erie Resistor Corp.
General Communication Co.
General Electric Co., Apparatus Sales Div.
Gertsch Products Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
I-L-S Instrument Corp.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Northeastern Engrg. Inc.
Potter Aeronautical Corp.
Saratoga Industries
Systron Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Varo Mfg. Co.
Wacline, Inc.
Walkirt Co.

Galvanometer

Assembly Products, Inc.
James G. Biddle Co.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Electronics International Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
Massa Labs., Inc.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Owen Labs., Inc.
Photron Instrument Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Wacline, Inc.

Grid Dip

Alto Scientific Co., Inc.
Boonton Electronics Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.

Impedance

Alto Scientific Co., Inc.
Hammett Electric Co.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gryoscope Co.
Narda Microwave Corp., The
North Altantic Industries, Inc.
Sun Electric Corp.
Terminal Radio Corp.

Industrial

Baird-Atomic, Inc.
Electro-Tech Equipment Co.
Hammett Electric Co.
General Electric Co., Apparatus Sales Div.
Instrument Laboratories
Gerard G. Leeds Co., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Peschel Electronics, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Infrared

Barnes Engineering Co.
Hammett Electric Co.
Infrared Industries Inc.
Production Research Corp.
Q. O. S. Corp.
Terminal Radio Corp.

Intermodulation

Empire Products Sales Corp.
Hammett Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Terminal Radio Corp.
Varo Mfg. Co.

Kilovolt

Associated Research, Inc.
Davenport Mfg. Co.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Gertsch Products Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Keithley Instruments, Inc.
Marion Electrical Instrument Co.
Meters Inc.
Opad Electric Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Ryan Aeronautical Co.
Terminal Radio Corp.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Kilowatt

Electro-Tech Equipment Co.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Light

Electro-Tech Equipment Co.
Hammett Electric Co.
Terminal Radio Corp.

Megohm

American Metrix Corp.
Associated Research, Inc.
James G. Biddle Co.
Brush Instruments, Div.-Clevite Corp.
Consoldiated Airborne Systems, Inc.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Hammett Electric Co.
Industrial Instruments Inc.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Microfrarad

Ballantine Labs., Inc.
Epic, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Microvolt

Alpha Instrument Co.
Boonton Electronics Corp.
Empire Products Sales Corp.
Epic, Inc.
Thomas T. Fox Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Microwave

Airtron, Inc.
Amerac Inc.
California Technical Industries, Div.-Textron Inc.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Electro Impulse Lab., Inc.
Thomas T. Fox Co.
Hammett Electric Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
*TELERAD MFG. CORP.
Terminal Radio Corp.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.

Milliampere

Alto Scientific Co., Inc.
American Metrix Corp.
Assembly Products, Inc.

Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Millivolt

Alpha Instrument Co.
Alto Scientific Co., Inc.
American Metrix Corp.
Assembly Products, Inc.
Ballantine Labs., Inc.
Bergen Labs.
Boonton Electronics Corp.
Curtiss-Wright Corp., Electronics Div.
Daven Co., The
Davenport Mfg. Co.
Dejur-Amsco Corp.
Dunlap Electronics, Inc.
Electric Design & Mfg. Co.
Epic, Inc.
Fisher Research Lab., Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Control Co.
*KAHN & CO., INC.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
North Atlantic Industries, Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Thermo Electric Co., Inc.

Modulation

Empire Products Sales Corp.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Moisture, Electronic

Alpha Instrument Co.
Consolidated Electrodynamics Corp.
Electronic Measurements Corp.
Hammett Electric Co.
Marconi Instruments
Moisture Register Co.
Terminal Radio Corp.

Multimeter

American Metrix Corp.
*ANTON ELECTRONIC LABS., INC.
Ballantine Labs., Inc.
Daven Co., The
Dejur-Amsco Corp.
Electro-Tech Equipment Co.
Hammett Electric Co.
Instrument Laboratories
Gerard G. Leeds Co., Inc.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
*RHEEM MFG. CO., ELECTRONICS DIV.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Termnial Radio Corp.
Wacline, Inc.

Multiplier

Daven Co., The
Electro-Tech Equipment Co.
Hammett Electric Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Noise, Electrical Measurement

Acton Laboratories Inc.
Airborne Instruments Lab., Inc.

[illegible] Corp.
Chesapeake Instrument Corp.
Empire Products Sales Corp.
Hammett Electric Co.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.
Western Electro-Acoustic Lab.

Ohm

Alpha Instrument Co.
American Metrix Corp.
Associated Research, Inc.
Bergen Labs.
James G. Biddle Co.
Davenport Mfg. Co.
J. W. Dice Co.
Electric Auto-Lite Co., The
Epic, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Meters Inc.
Non-Linear Systems Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Output, Electrical Measurement

American Metrix Corp.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Precision Apparatus Co., Inc.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Output, R-F

Boonton Electronics Corp.
Daven Co., The
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Panel

American Metrix Corp.
Assembly Products, Inc.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
Marion Electrical Instrument Co.
Meters Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Trio Laboratories, Inc.
Wacline, Inc.

Ph Meters, Recorders & Comparators

Hammett Electric Co.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photovolt Corp.
Polarad Electronics Corp.
Terminal Radio Corp.

Phase

Acton Laboratories Inc.
Bergen Labs.
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
North Atlantic Industries, Inc.
Ryan Aeronautical Co.
Systron Corp.
Telechrome Mfg. Corp.
Terminal Radio Corp.
Theta Instrument Corp.
Trio Laboratories, Inc.
Varo Mfg. Co.
Weston Hydraulics, Ltd.
Wintronics

Photoelectric Reflection

Eldorado Electronics
Hammett Electric Co.
Photovolt Corp.
Terminal Radio Corp.

Power Output

Daven Co., The
Ess Instrument Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Terminal Radio Corp.

Pressure

***AEROTEST LABORATORIES, INC.**
Barton Instrument Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Decker Corp., The
Dynamic Instrument Co., Inc.
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Servomechanisms, Inc.
Systron Corp.
Terminal Radio Corp.
U. S. Gauge Div., American Machine & Metals, Inc.

Pyrometer

Barnes Engineering Co.
Eisler Engrg. Co., Inc.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Illinois Testing Laboratories, Inc.
Leeds & Northrup Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Phaostron Instrument & Electronic Co.
Pyrometer Instrument Co., Inc.
Terminal Radio Corp.

Q

Alpha Instrument Co.
Boonton Radio Corp.
Hammett Electric Co.
Kay Electric Co.
Marconi Instruments
Terminal Radio Corp.

Radiation, Nuclear

Baird-Atomic, Inc.
Hammett Electric Co.
Jordan Electronics, Div.-Victoreen Instrument Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Nuclear-Chicago Corp.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Systron Corp.
Terminal Radio Corp.

Rate

Baird-Atomic, Inc.
Erie Resistor Corp.
Hammett Electric Co.
Instruments Div.-Philips Electronics, Inc.
Gerard G. Leeds Co., Inc.
Miljan Div., Paul Omohundro Co.
Potter Aeronautical Corp.
Radiation Counter Labs., Inc.
Systron Corp.
Terminal Radio Corp.

Ratio

Baird-Atomic, Inc.
Barton Instrument Corp.
Brunswick Instruments
Dynac, Inc.
Fischer & Porter Co.
Guardian Electric Mfg. Co.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Non-Linear Systems Inc.
Potter Aeronautical Corp.
Terminal Radio Corp.
Transformers, Inc.

Recording

Antlab Inc.
Electro-Tech Equipment Co.
Fischer & Porter Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Potter Aeronautical Corp.
Research Appliance Co.
Telectro Industries Corp.
Terminal Radio Corp.

R-F Power

Aircom Inc.
Brunswick Instruments
Electro Impulse Lab., Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Marconi Instruments
Polarad Electronics Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.
Wacline, Inc.

Snap Around

Electro-Tech Equipment Co.
Hammett Electric Co.
Terminal Radio Corp.

Sound Level

Chesapeake Instrument Corp.
Daven Co., The
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Herman Hosmer Scott, Inc.
Simpson Electric Co.
Terminal Radio Corp.
Western Electro-Acoustic Lab.

Spectral

Baird-Atomic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Polarad Electronics Corp.
Terminal Radio Corp.

Standing Wave Radio

Alpha Instrument Co.
Alto Scientific Co., Inc.
Browning Laboratories, Inc.
California Technical Industries, Div.-Textron Inc.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Electro Impulse Lab., Inc.
Hammett Electric Co.
E. F. Johnson Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Terminal Radio Corp.
Uniwave, Inc.

Tachometer

Acromag Inc.
Amthor Testing Insrtument Co., Inc.
Associated Research, Inc.
James G. Biddle Co.
Computer-Measurements Corp.
Consolidated Airborne Systems, Inc.
Dynac, Inc.
Electric Auto-Lite Co., The
Electro Products Labs., Inc.
Electro-Tech Equipment Co.
Epic, Inc.
Geartronics Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
I-L-S Instrument Corp.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Uniwave, Inc.
Wacline, Inc.

Tension

Daytronic Corp.
Hammett Electric Co.
Terminal Radio Corp.
Wacline, Inc.

Thermocouple

Acromag Inc.
Assembly Products, Inc.
Avien, Inc.
Consolidated Controls Corp.
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Illinois Testing Laboratories, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Pyrometer Instrument Co., Inc.
Royco Instruments

Simpson Electric Co.
Terminal Radio Corp.
Thermo Electric Co., Inc.
Wacline, Inc.

Thermometer

Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Illinois Testing Laboratories, Inc.
Lewis Engrg. Co., The
Minco Products, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Palmer Thermometers, Inc.
Powers Regulator Co., The
***ROCHESTER MFG. CO. INC.**
Simpson Electric Co.
Terminal Radio Corp.

Thrust

B & F Instruments, Inc.
Consolidated Controls Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photocon Research Products
Terminal Radio Corp.
U. S. Gauge Div., American Machine & Metals, Inc.

Time

Bergen Labs.
M. Ducommun Co.
Electro-Tech Equipment Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Terminal Radio Corp.
Wacline, Inc.

Torque

B & F Instruments, Inc.
Bergen Labs.
Consolidated Controls Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Terminal Radio Corp.
U. S. Gauge Div., American Machine & Metals, Inc.

Ultra-Violet

Alpha Instrument Co.
Hammett Electric Co.
Menlo Research Lab.
Process & Instruments
Terminal Radio Corp.
Ultra-Violet Products, Inc.

Vacuum Tube Volt

Acton Laboratories Inc.
Alto Scientific Co., Inc.
Ballantine Labs., Inc.
Boonton Electronics Corp.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leitch Engrg. Corp.
North Atlantic Industries, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Trio Laboratories, Inc.
Waveforms, Inc.

Vibrating Reed

James G. Biddle Co.
Hammett Electric Co.
Terminal Radio Corp.

Vibration

Columbia Research Labs.
Consolidated Electrodynamics Corp.
Epic, Inc.
Hammett Electric Co.
***KAHN & CO., INC.**
Kay Electric Co.
MB Mfg. Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Viscosity, Electronic

Electronic Measurements Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Terminal Radio Corp.

Volt-Ohm, Electronic

Associated Research, Inc.
Bergen Labs.
Electronic Associates, Inc.
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Non-Linear Systems Inc.
Precision Apparatus Co., Inc.
Southwestern Industrial Electronics Co.
Systron Corp.
Terminal Radio Corp.
Trio Laboratories, Inc.

Watt

Bergen Labs.
Chemalloy Electronics Corp.
Electro Impulse Lab., Inc.
Electro-Tech Equipment Co.
Epic, Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Microwave Electronics Div., Sperry Gyroscope Co.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Watt-Hour

General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Sangamo Electric Co.
Southwest Products Co.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Wave

Aircom Inc.
Amerac Inc.
Electronic Mechanics, Inc.
Hammett Electric Co.
Kay Electric Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Radar Design Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.

MICA, GLASS BONDED

Allied Plastics Supply Corp.
William Brand & Co., Inc.
Magnetic Shield Div.-Perfection Mica Co.
Mycalex Corp. of America

MICROMETERS, ELECTRONIC

Decker Corp., The
J. W. Dice Co.
Hammett Electric Co.

MICRO-OHMMETERS

Hammett Electric Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Transvision, Inc.

MIRRORS, INSPECTION

American Optical Co., Instrument Div.
***BAUSCH & LOMB OPTICAL CO.**
Buhl Optical Co.
Engrg. Developments, Inc.
J. W. Fecker, Inc., Sub.-American Optical Co.
Lancaster Glass Corp.
Pacific Universal Products Corp.

MIRRORS, SPECIAL PURPOSE

Acme Industrial Co.
American Optical Co., Instrument Div.
Atlantic Research Corp.
Baird-Atomic, Inc.
***BAUSCH & LOMB OPTICAL CO.**
Buhl Optical Co.
Davidson Mfg. Co.
Eastman Kodak Co.
J. W. Fecker, Inc., Sub.-American Optical Co.
Lancaster Glass Corp.
Metavac, Inc.
Optomechanisms, Inc.
Pacific Universal Products Corp.
Zenith Optical Laboratory

NUCLEAR

***ANTON ELECTRONIC LABS., INC.**
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Eldorado Electronics
Garde Mfg. Co.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Analyzers, Coincidence

BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Eldorado Electronics
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Analyzers, Neutron Absorption

American Electronics, Inc.
Baird-Atomic, Inc.
Eldorado Electronics
Electronic Instrumentation Co., Div.-Ramo-Wooldridge Corp.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Analyzers, Spectrum

BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Consolidated Electrodynamics Corp.
Eldorado Electronics
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Assemblies, Shield

Baird-Atomic, Inc.
General Nuclear Corp.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Badges, Radiation

American Electronics, Inc.
Eastman Kodak Co.
Gerard G. Leeds Co., Inc.
Nemeth, Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Sohl Co., The
Telectro Industries Corp.
Terminal Radio Corp.

Counters

American Electronics, Inc.
***ANTON ELECTRONIC LABS., INC.**
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
General Nuclear Corp.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Northeastern Engrg. Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
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Meters, Nuclear Radiation

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Radioactive Stak

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Tubes, Scintillation

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Telectro Industries Corp.
Terminal Radio Corp.

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Haller Raymond & Brown Inc.
Hammett Electric Co.
North Atlantic Industries, Inc.
Nuclear Corp. of America, Inc.
Ryan Aeronautical Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Theta Instrument Corp.
Varo Mfg. Co.
Wintronics

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Bergen Labs.
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Hallamore Electronics Co.
Hammett Electric Co.
Mercury International Industries Inc.
North Atlantic Industries, Inc.
Ryan Aeronautical Co.
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Telechrome Mfg. Corp.
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Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
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Edcliff Instruments
Endevco Corp.
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Fairchild Controls Corp., Components Div.
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Iron Fireman Mfg. Co., Electronics Div.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Mercury International Industries Inc.
Photocon Research Products
Servomechanisms, Inc.
Trans-Sonics, Inc.
Ultradyne, Inc.

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Atlantic Research Corp.
Conax Corp.
Electronic Processes Corp. of California
Fenwal Inc.
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Illinois Testing Laboratories, Inc.
Rahm Instruments, Div.-American Machine & Metals, Inc.
Trans-Sonics, Inc.
United Control Corp.
Vap-Air Div., Vapor Heating Corp.

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Computer Instruments Corp.
Edcliff Instruments
Fairchild Controls Corp., Components Div.
Friez Instrument Div.-Bendix Aviation Corp.
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Iron Fireman Mfg. Co., Electronics Div.
Rahm Instruments, Div.-American Machine & Metals, Inc.
Servonic Instruments, Inc.
Trans-Sonics, Inc.

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Edcliff Instruments
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Friez Instrument Div.-Bendix Aviation Corp.
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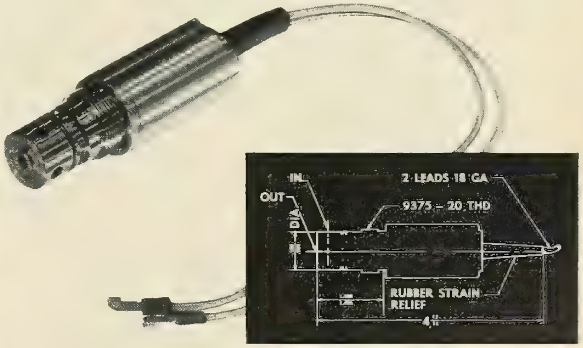

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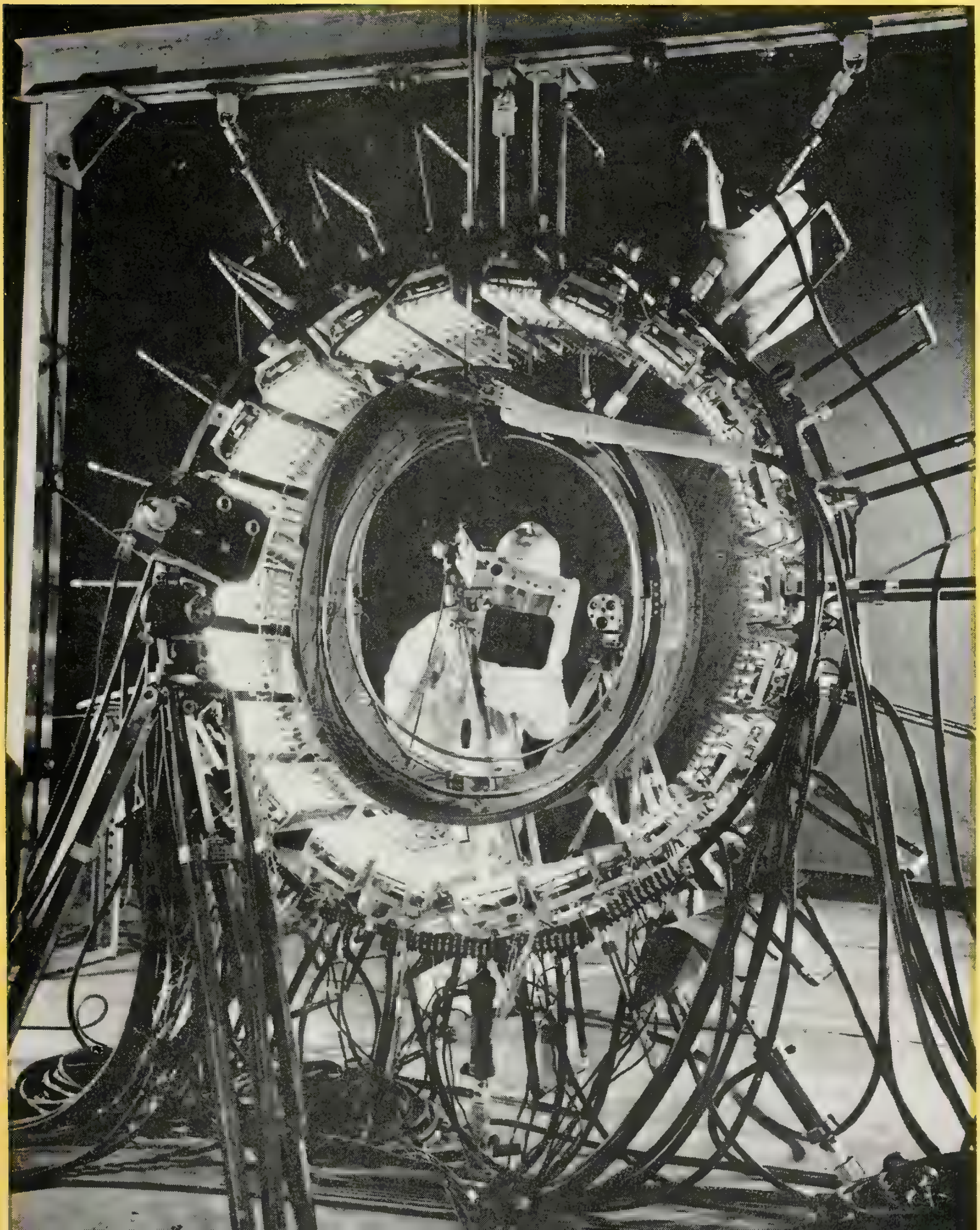

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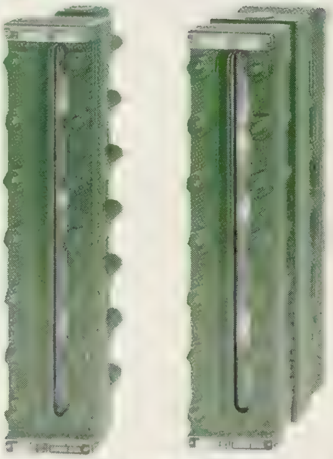
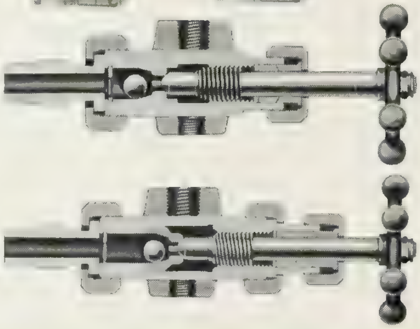
In the missile program, Penberthy gages and valves are serving successfully in a variety of applications from testing to fuel loading. They are obtainable in a choice of materials and designs, both standard and special, for handling liquids of any kind. Used individually and in sets. All materials are strictly according to ASTM, ASME and API specifications.



REFLEX (fluid shows black) — 3 pressure groups, liquid chamber lengths to 12′, feature light weight, low cost, strength, safety and durability. Service to 3000 psig.

TRANSPARENT (for fluid observation) — 4 pressure groups, liquid chamber lengths to 12′, feature exceptional strength, safety and ruggedness. Service to 10,000 psig.



GAGE VALVES (for tubular and flat glass) — available in selection of materials and designs. Penberthy's patented "floating shank" eliminates assembly difficulties caused by variations in vessel connections.

Special Service Designs and Accessories

HEATING-COOLING GAGES — To suit conditions where liquid is cooled or heated to stabilize level. Two designs.

FROST PROOF GAGES — Insulates against closure of visibility with frost.

WELDING PAD GAGES — Provide observation windows as integral part of vessel.

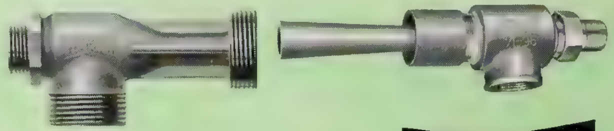
MISCELLANEOUS DESIGNS — Retort chambers, welding-flanged-side connected, plastic or rubber lined units and other special designs supplied to individual requirements.

ACCESSORIES — Explosion-proof and standard illuminators, protectors, instrument valves, trycocks, drain and vent valves and gage scales.

Write for detailed literature. Penberthy engineers are also at your service for consultation and recommendations.

[illegible] (JET PUMPS)

Used increasingly to simplify handling of fluids, vapors, gases and "hot" materials. Steam air and liquid operated for liquid transfer, heating, circulating, aerating, agitating, mixing, pumping, blending, exhausting. Trouble-free. Available in selection of materials. Standard and Special Designs.



PENBERTHY MANUFACTURING CO.
Division of Buffalo-Eclipse Corporation
1242 Holden Avenue, Detroit 2, Michigan
Manufacturers of Quality Products Since 1886

PENBERTHY

TEST EQUIPMENT

ACTUATORS, ELECTRIC

*ADVANCE GEAR & MACHINE CORP.
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Airborne Accessories Corp.
Applied Dynamics Corp.
Atlantic Research Corp.
Autotron, Inc.
*AVCO MFG. CORP., CROSLEY DIV.
Barber-Colman Co.
Barton Instrument Corp.
CDC Control Services, Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
James Cunningham Son & Co., Inc.
Joe Davidson & Associates
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Communications, Inc.
Exact Engrg. & Mfg. Inc.
Foote Brothers Gear & Machine Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geartronics Corp.
General Controls Co.
General Nuclear Corp.
Gray Mfg. Co., The
*GREER HYDRAULICS, INC.
Hammett Electric Co.
*A. W. HAYDON CO., THE
*KAHN & CO., INC.
Kearfott Co., Inc.
Lyndon Aircraft, Inc.
Lytle Engrg. & Mfg. Co.
Menasco Mfg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Sun Electric Corp.
Talco Engrg. Co., The
Talley Corp., The
Thompson Products, Inc.
Wacline, Inc.
Wells Industries Corp.

ACTUATORS, HYDRAULIC

*ADVANCE GEAR & MACHINE CORP.
Aeroproducts Operations, Allison Div., General Motors Corp.
Applied Dynamics Corp.
Arkwin Industries, Inc.
Atlantic Research Corp.
Autonetics, Div.-North American Aviation, Inc.
Bendix Products Div., Bendix Aviation Corp.
CDC Control Services, Inc.
Cadillac Gage Co.
Clemco Aero Products, Inc.
Consolidated Controls Corp.
Consolidated Diesel Electric Corp., Test Equip. Div.
Joe Davidson & Associates
*DIVERSEY ENGRG. CO.
*EASTERN INDUSTRIES, INC.
Eaton Mfg. Co., Inc., Fredric Flader Div.
*ELECTROL INC.
Engelberg Huller Co., Inc.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geartronics Corp.
Greenbrier Instruments Inc.
*GREER HYDRAULICS, INC.
Hagan Chemicals & Controls, Inc.
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Hydra-Power Corp.
Kearfott Co., Inc.
Kelsey-Hayes Co.
Kemp Aero Products, Div.-Kemp Inc.
Lyndon Aircraft, Inc.
McDowell Co. Inc.
Menasco Mfg. Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
O & M Machine Co., Inc.
Ozone Metal Products Corp.
Pacific Div.-Bendix Aviation Corp.
Petch Mfg. Co.
Progressive Research & Development Co., Inc.
Royal Industries, Inc.
Rucker Co., The
Sancor Corp.
Sun Electric Corp.
Talco Engrg. Co., The
Thompson Products, Inc.
Trimount Instrument Co.
Vard Inc.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Vinson Mfg. Co. Inc.
Waldorf Instrument Co., Div.-F. C. Huyck & Sons
Weighing & Control Components, Inc.
Wells Industries Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Weston Hydraulics, Ltd.
Whittaker Controls, Div.-Telecomputing Corp.

ADAPTERS

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General R-F Fittings, Inc.
Sylvania Electric Products Inc., Parts Div.

Crystal

Elm Mfg. Co. Inc.
General R-F Fittings, Inc.
Reeves-Hoffman Div.
Uniwave, Inc.

Foreign

General R-F Fittings, Inc.
Kulka Electric Corp.

Lamp Socket

American Brass Co., The
Connector Corp.
General R-F Fittings, Inc.
Kulka Electric Corp.
Frank W. Morse Co.

Line and Dot Sequential

General R-F Fittings, Inc.

Phase

General R-F Fittings, Inc.
Varo Mfg. Co.

Plug

Amaton Electronic Hardware Co. Inc.
General R-F Fittings, Inc.

Test

Alden Products Co.
General R-F Fittings, Inc.

Tube

Alden Products Co.

Tube Socket

Alden Products Co.
Connector Corp.
Elco Corp.
Pomona Electronics Co., Inc.
Sylvania Electric Products Inc., Parts Div.
Vector Electronic Co.

ALARM SYSTEMS

Briggs Asosciates, Inc.
Browning Laboratories, Inc.
Devco Engrg. Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Fischer & Porter Co.
*GREER HYDRAULICS, INC.
Hallamore Electronics Co.
Hammett Electric Co.
*KAHN & CO., INC.
Philadelphia Scientific Glass Co.
Systron Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

ALARMS, AUTO

Devco Engrg. Inc.
Hammett Electric Co.
Thompson-Ramo-Wooldridge Products Co., The

ALNICO

Crucible Steel Co. of America
Hammett Electric Co.
Permag Corp.
Thomas & Skinner, Inc.
*WESTINGHOUSE ELECTRIC CORP.

ALTERNATORS

Joe Davidson & Associates
Eicor Div.-F. L. Jacobs Co.
Electric Auto-Lite Co., The
Electric Motors & Specialties, Inc.
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Georator Corp.
Hammett Electric Co.
Hertner Electric Co., The
Sun Electric Corp.
Talley Corp., The
Task Corp.
United Mfg. Co. Div., The W. L. Maxson Corp.
Varo Mfg. Co.
Wacline, Inc.

ALTIMETERS, BAROMETRIC PRESSURE

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Ideal-Aerosmith, Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
*WALLACE O. LEONARD, INC.
Victory Engineering Corp.

AMMETERS

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Assembly Products, Inc.
Beede Electrical Instrument Co. Inc.
Columbia Electric Mfg. Co.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Meters Inc.
Simpson Electric Co.
Sun Electric Corp.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

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Alto Scientific Co., Inc.
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American Electronic Labs., Inc.
American Research & Mfg. Corp.
Arnoux Corp.
Atlantic Research Corp.
Autonetics, Div.-North American Aviation, Inc.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Brush Instruments, Div.-Clevite Corp.
J. H. Bunnell & Co.
Burr-Brown Research Corp.
Burroughs Corp.
Canoga Corp. of California
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Daven Co., The
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gray Mfg. Co., The
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
International Research Associates
Gerard G. Leeds Co., Inc.
Librascope Inc.
Maico Electronics, Inc.
McKenna Labs.
Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.

PHOTO ON TEST EQUIPMENT DIVIDER PAGE: The triple torture of simultaneous heating and cooling of a metal ring is studied by North American structures engineers with a motion picture camera.

Ryan Aeronautical Co.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Audio Subminiature

Alpha Instrument Co.
Alto Scientific Co., Inc.
Atlantic Research Corp.
*COOPER DEVELOPMENT CORP.
*DATA-CONTROL SYSTEMS INC.
Daven Co., The
Doty Acoustica Electronic Labs.
Du Kane Corp.
Dunlap Electronics, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Elgin Micronics-West Coast Div.-Elgin National Watch Co.
Gray Mfg. Co., The
Haller Raymond & Brown Inc.
Instrument Laboratories
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Lytle Engrg. & Mfg. Co.
M F Electronics Co.
Maico Electronics, Inc.
J. A. Maurer, Inc.
Polarad Electronics Corp.
Reeves Instrument Corp.
Roflan Co., The
Ryan Aeronautical Co.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Varo Mfg. Co.
Walkirt Co.
Western Electro-Acoustic Lab.
Winder Aircraft Corp. of Fla.

Cathode Followers

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Allegany Instrument Co., Inc.
Amelco, Inc.
Arnoux Corp.
Atlantic Research Corp.
Audio Instrument Co. Inc.
Canoga Corp. of California
Columbia Research Labs.
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*DATA-CONTROL SYSTEMS INC.
Daven Co., The
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Electronic Associates, Inc.
Electronics Corp. of America
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Haller Raymond & Brown Inc.
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Orbitran Co., Inc.
Polarad Electronics Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Walkirt Co.
Western Electro-Acoustic Lab.

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Analogue Controls, Inc.
Arnoux Corp.
CDC Control Services, Inc.
Canoga Corp. of California
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Consolidated Avionics Corp.
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Haller Raymond & Brown Inc.
Hanson-Gorrill-Brian, Inc.
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Minneapolis-Honeywell Regulator Co., Aeronautical Div.
George A. Philbrick Researches, Inc.
Reeves Instrument Corp.
Saratoga Industries
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Walkirt Co.

DC

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Alpha Instrument Co.
Amelco, Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Arnoux Corp.
Autotron, Inc.
Bogue Electric Mfg., Co.
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Consolidated Avionics Corp.
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Consolidated Electrodynamics Corp.
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Gates Electronic Co.
Georator Corp.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
Industrial Control Co.
Instrument Motors
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Kelsey-Hayes Co.
Kin Tel Div.-Cohu Electronics, Inc.
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Leeds & Northrup Co.
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Lumen, Inc.
Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics Inc.
Ralph M. Parsons Co., The, Electronics Div.
George A. Philbrick Researches, Inc.
Photocon Research Products
Photron Instrument Co.
Process & Instruments
Reeves Instrument Corp.
Resdel Engrg. Corp.
*RHEEM MFG. CO., ELECTRONICS DIV.
Ryan Aeronautical Co.
Sanborn Co.
Saratoga Industries
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Trans Electronics, Inc.
United Control Corp.
Westbury Electronics Inc.
Winder Aircraft Corp. of Fla.

Decade, Audio

Acton Laboratories Inc.
Amelco, Inc.
Ballantine Labs., Inc.
Burr-Brown Research Corp.
Daven Co., The
Dunlap Electronics, Inc.
Electronics Corp. of America
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
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Owen Labs., Inc.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Westbury Electronics Inc.
Western Electro-Acoustic Lab.
Winder Aircraft Corp. of Fla.

Development

Amelco, Inc.
American Research & Mfg. Corp.
Atlantic Research Corp.
Autotron, Inc.
Burroughs Corp.
*COOPER DEVELOPMENT CORP.
*DATA-CONTROL SYSTEMS INC.
Doty Acoustica Electronic Labs.
Du Kane Corp.
Haller Raymond & Brown Inc.
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Librascope Inc.
Maico Electronics, Inc.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Westbury Electronics Inc.
Western Electro-Acoustic Lab.

Differential

Acromag Inc.
Allegany Instrument Co., Inc.
Amelco, Inc.
American Research & Mfg. Corp.
Analogue Controls, Inc.
Atlantic Research Corp.
Boonton Electronics Corp.
Burr-Brown Research Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
*DATA-CONTROL SYSTEMS INC.
Du Kane Corp.
Edin Co., Inc.
Electro Instruments, Inc.
Electronic Associates, Inc.
Epsco Inc.
Haller Raymond & Brown Inc.
Keithley Instruments Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Lumen, Inc.
Mid-Century Instrumatic Corp.
Offner Electronics Inc.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Trans Electronics, Inc.
United Control Corp.
Walkirt Co.

Direct Current

Acromag Inc.
Airborne Accessories Corp.
Allegany Instrument Co., Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Arnoux Corp.
Boonton Electronics Corp.
Brush Instruments, Div.-Clevite Corp.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Curtiss-Wright Corp., Electronics Div.
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Daven Co., The
Du Kane Corp.
Dynamics Instrumentation Co., Div.-Alberhill Corp.
Edin Co., Inc.
Electronic Associates, Inc.
Electronics Corp. of America
Epsco Inc.
Georator Corp.
Haller Raymond & Brown Inc.
Heiland Div.-Minneapolis-Honeywell
Hoover Electronics Co.
*INTERELECTRONICS CORP.
Keithley Instruments, Inc.
Kelsey-Hayes Co.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Boston Div.
Offner Electronics Inc.
Photocon Research Products
Photron Instrument Co.
Reeves Instrument Corp.
*RHEEM MFG. CO., ELECTRONICS DIV.
Sanborn Co.
Sartoga Industries
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
United Control Corp.
Walkirt Co.

Distribution, Audio

Browning Laboratories, Inc.
Du Kane Corp.
Empire Products Sales Corp.
Haller Ryamond & Brown Inc.
Instrument Motors
*INTERELECTRONICS CORP.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Thompson Products, Inc.

Distribution, R-F-I-F

Blonder-Tongue Labs., Inc.
Entron, Inc.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Instrument Motors
Instruments for Industry, Inc.
Polarad Electronics Corp.
Telechrome Mfg. Corp.

Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Westbury Electronics Inc.

Encapsulated

American Research & Mfg. Corp.
Arnoux Corp.
Burroughs Corp.
*COOPER DEVELOPMENT CORP.
Daven Co., The
Doty Acoustica Electronic Labs.
Du Kane Corp.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Electronics Corp. of American
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Epsco Inc.
Gulton Industries, Inc.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Kelsey-Hayes Co.
Librascope Inc.
M F Electronics Co.
Reeves Instrument Corp.
Saratoga Industries
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
United Control Corp.
Walkirt Co.

Instrumentation

Acromag Inc.
Alto Scientific Co., Inc.
American Research & Mfg. Corp.
Arnoux Corp.
Avien, Inc.
Baird-Atomic, Inc.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Columbia Research Labs.
Computer Engrg. Associates, Inc.
Consolidated Airborne Systems, Inc.
Consolidated Avionics Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
*DATA-CONTROL SYSTEMS INC.
Daytronic Corp.
Dunlap Electronics, Inc.
Dynamics Instrumentation Co., Div.-Alberhill Corp.
Edin Co., Inc.
Electro Products Labs., Inc.
Electronic Associates, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Epsco Inc.
Gulton Industries, Inc.
Haller Raymond & Brown Inc.
Heiland Div.—Minneapolis-Honeywell
*INTERELECTRONICS CORP.
Keithley Instruments, Inc.
Kelsey-Hayes Co.
Kin Tel Div.-Cohu Electronics, Inc.
Librascope Inc.
Lumen, Inc.
Lytle Engrg. & Mfg. Co.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
North Atlantic Industries, Inc.
Offner Electronics Inc.
*PACKARD-BELL ELECTRONICS CORP.
George A. Philbrick Researches, Inc.
Photron Instrument Co.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
United Control Corp.
Western Electro-Acoustic Lab.

Intermediate Frequency

Adler Electronics, Inc.
Airborne Instruments Lab., Inc.
Amelco, Inc.
J. H. Bunnell & Co.
Canoga Corp. of California
Daven Co., The
Dwyer Engrg. Co., Inc.
Georator Corp.
Haller Raymond & Brown Inc.
Instruments for Industry, Inc.
*INTERELECTRONICS CORP.
L E L, Inc.
Panoramic Radio Products, Inc.
Polarad Electronics Corp.
Seeburg Corp., The
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Isolation

Alfred Electronics
American Research & Mfg. Corp.
Bendix Radio Div.-Bendix Aviation Corp.
Burr-Brown Research Corp.
Computer Engrg. Associates, Inc.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Limiting

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Dynamics Instrumentation Co., Div.-Alberhill Corp.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Line

American Research & Mfg. Corp.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Logarithmic

Audio Instrument Co. Inc.
California Technical Industries, Div.-Textron Inc.
Electronic Associates, Inc.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
Keithley Instruments, Inc.
L E L, Inc.
Lumen, Inc.
F. L. Moseley Co.
Radiation Counter Labs., Inc.
Sanborn Co.
Herman Hosmer Scott, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Western Electro-Acoustic Lab.

Microwave

Adler Electronics, Inc.
Aircom Inc.
Airtron, Inc.
Alfred Electronics
Amerac Inc.
American Electronic Labs., Inc.
Canoga Corp. of California
Demornay-Bonardi
Empire Products Sales Corp.
Thomas T. Fox Co.
Geisler Labs.
Goodyear Labs.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Stromberg-Carlson, Electronics Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.
Wave Particle Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

Mixing Audio

Adler Electronics, Inc.
Browning Laboratories, Inc.
J. H. Bunnell & Co.
Daven Co., The
Dunlap Electronics, Inc.
Haller Raymond & Brown Inc.
Magnasync Mfg. Co., Ltd.
J. A. Maurer, Inc.
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Seeburg Corp., The
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Western Electro-Acoustic Lab.

Mixing, R-F

Adler Electronics, Inc.
Amelco, Inc.
Blonder-Tongue Labs., Inc.
J. H. Bunnell & Co.
Canoga Corp. of California
Centronix Inc.
Daven Co., The
Empire Products Sales Corp.
Entron, Inc.
Geisler Labs.
Goodyear Aircraft Corp.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Seeburg Corp., The
Stromberg-Carlson, Electronics Div.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Wave Particle Corp.
Westbury Electronics Inc.

Mobile

American Research & Mfg. Corp.
Brush Instruments, Div.-Clevite Corp.
Computer Engrg. Associates, Inc.
Edin Co., Inc.
Haller Raymond & Brown Inc.
Hammett Electric Co.
*INTERELECTRONICS CORP.
Stromberg-Carlson, Electronics Div.
Sun Electric Corp.
Telectro Industries Corp.

Monitoring Audio

Daven Co., The
Dunlap Electronics, Inc.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Magnasync Mfg. Co., Ltd.
J. A. Maurer, Inc.
Herman Hosmer Scott, Inc.
Setchell-Carlson Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Monitoring R-F

Centronix Inc.
Edin Co., Inc.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
*PACKARD-BELL ELECTRONICS CORP.
*RADIATION, INC.
Setchell-Carlson, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Operational

American Research & Mfg. Corp.
CDC Control Services, Inc.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
*COOPER DEVELOPMENT CORP.
Daven Co., The
Dynamics Instrumentation Co., Div.-Alberhill Corp.
Electronic Associates, Inc.
Haller Raymond & Brown Inc.
Keithley Instruments, Inc.
Kelsey-Hayes Co.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Lumen, Inc.
Mid-Century Instrumatic Corp.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston, Div.
George A. Philbrick Researches, Inc.
Reeves Instrument Corp.
*RHEEM MFG. CO., ELECTRONICS DIV.
Skiatron Electronics & Television Corp.
Sun Electric Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.

Oscilloscope

Acton Laboratories Inc.
Adler Electronics, Inc.
Allegany Instrument Co., Inc.
American Electronic Labs., Inc.
Centronix Inc.
Dunlap Electronics, Inc.
Edgerton, Germeshausen & Grier, Inc.
Edin Co., Inc.
Grass Instrument Co.
Haller Raymond & Brown Inc.
Industrial Television Inc.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Railway Communications Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
United Control Corp.

Peak Limiting

American Research & Mfg. Corp.
Daven Co., The
Haller Raymond & Brown Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Plug-In

Alden Products Co.
Atlantic Research Corp.
Bulova Watch Co., Electronics Div.
Computer Engrg. Associates, Inc.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Du Kane Corp.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Dynamics Instrumentation Co., Div.-Alberhill Corp.
Edin Co., Inc.
Electronic Associates, Inc.
Haller Raymond & Brown Inc.
Kay Electric Co.
Lane Electronics Mfg. Corp.
Lumen, Inc.
Lytle Engrg. & Mfg. Co.
George A. Philbrick Researches, Inc.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
United Control Corp.
Walkirt Co.
Winder Aircraft Corp. of Fla.

Power

Airborne Accessories Corp.
American Research & Mfg. Corp.
Bogue Electric Mfg., Co.
***DATA-CONTROL SYSTEMS INC.**
Du Kane Corp.
Edin Co., Inc.
Electronic Assembly Co., Inc.
Haller Raymond & Brown Inc.
Hanson-Gorrill-Brian, Inc.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
***INTERELECTRONICS CORP.**
E. F. Johnson Co.
Gerard G. Leeds Co., Inc.
George A. Philbrick Researches, Inc.
Resdel Engrg. Corp.
Saratoga Industries
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Walkirt Co.
***WESTINGHOUSE ELECTRIC CORP.**
Winder Aircraft Corp. of Fla.

Stabilizing

Adler Electronics, Inc.
Amelco, Inc.
American Research & Mfg. Corp.
Edin Co., Inc.
Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
George A. Philbrick Researches, Inc.
Photron Instrument Co.
Reeves Instrument Corp.
Southwestern Industrial Electronics Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.

Strain Gage

Allegany Instrument Co., Inc.
Amelco, Inc.
American Research & Mfg. Corp.
Baird-Atomic, Inc.
Boonton Electronics Corp.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Computer Engrg. Associates, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Curtiss-Wright Corp., Electronics Div.
***DATA-CONTROL SYSTEMS INC.**
Datran Electronics, Div.—Mid-Continent Mfg., Inc.
Daytronic Corp.
Dynamics Instrumentation Co., Div.-Alberhill Corp.
Edin Co., Inc.
Epsco Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Haller Raymond & Brown Inc.
Heiland Div.-Minneapolis-Honeywell
Gerard G. Leeds Co., Inc.
Lumen, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics Inc.
Owen Labs., Inc.
Photron Instrument Co.
Sanborn Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Ultrasonic

Acoustica Associates, Inc.
Alcar Instruments, Inc.
Arenberg Ultrasonic Laboratory, Inc.
Atlantic Research Corp.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Georator Corp.
Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
McKenna Labs.
Photocon Research Products
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Wideband, Audio

Alpha Instrument Co.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
Atlantic Research Corp.
Burr-Brown Research Corp.
Daven Co., The
Dunlap Electronics, Inc.
Dynamics Instrumentation Co., Div.-Alberhill Corp.
Epsco Inc.
Haller Raymond & Brown Inc.
Munston Mfg. & Service, Inc.
Ryan Aeronautical Co.
Herman Hosmer Scott, Inc.
Seeburg Corp., The
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Western Electro-Acoustic Lab.
***WESTINGHOUSE ELECTRIC CORP.**

Wideband, R-F

Alpha Instrument Co.
American Electronic Labs., Inc.
Arenberg Ultrasonic Laboratory, Inc.
Bendix Aviation Corp., York Div.
Blonder-Tongue Labs., Inc.
Daven Co., The
Entron, Inc.
Geisler Labs.
Goodyear Aircraft Corp.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Instruments for Industry, Inc.
Munston Mfg. & Service, Inc.
Resdel Engrg. Corp.
Seeburg Corp., The
Telechrome Mfg. Corp.
Tel-Instrument Electronics Corp.
Westbury Electronics Inc.

ANALYSIS EQUIPMENT, ELECTRO-CHEMICAL

Baird-Atomic, Inc.
Calcor Corp., Aircraft Div.
Consolidated Electrodynamics Corp.
Devco Engrg. Inc.
Greenbrier Instruments Inc.
Monarch Aircraft Sales, Inc.
George L. Nankervis Co.
Milton Roy Co.

ANALYZERS

Advance Industries, Inc.
Allegany Instrument Co., Inc.
Barnes Development Co.
Bendix Aviation Corp., York Div.
Benson-Lehner Corp.
Bogue Electric Mfg., Co.
Brush Instruments, Div.-Clevite Corp.
Consolidated Electrodynamics Corp.
Dit-Mco, Inc., Electronics Div.
Dynac, Inc.
Epic, Inc.
Fenske Fedrick & Miller Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Haller Raymond & Brown Inc.
***KAHN & CO., INC.**
Lear, Inc., Grand Rapids Div.
Perkin-Elmer Corp.
Precision Apparatus Co., Inc.
Milton Roy Co.
Telectro Industries Corp.

Antenna Pattern

Airborne Instruments Lab., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Antlab Inc.
California Technical Industries, Div.-Textron Inc.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Haller Raymond & Brown Inc.
Kay Electric Co.
Polarad Electronics Corp.
Scientific-Atlanta, Inc.
Telectro Industries Corp.

Audio, Amplifier

Brush Instruments, Div.-Clevite Corp.
Haller Raymond & Brown Inc.
Kay Electric Co.
Northeast Electronics Corp.
Ryan Aeronautical Co.
Setchell-Carlson Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Cable

Barnes Development Co.
California Technical Industries, Div.-Textron Inc.
James Cunningham Son & Co., Inc.
Dit-Mco, Inc., Electronics Div.
Electric Auto-Lite Co., The
Jefferson Products Corp.
Kay Electric Co.
Lane Electronics Mfg. Corp.
Minco Products, Inc.
Radar Engineers
Slaughter Co., Inc.
Telectro Industries Corp.

Capicitor

Boonton Electronics Corp.
Network Mfg. Corp.
Precision Apparatus Co., Inc.
Southern Electronics Corp.
Telectro Industries Corp.

Circuit

Allegany Instrument Co., Inc.
Amelco, Inc.
Bogue Electric Mfg., Co.
California Technical Industries, Div.-Textron Inc.
James Cunningham Son & Co., Inc.
Dit-Mco, Inc., Electronics Div.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Kay Electric Co.
Lavoie Labs., Inc.
Precision Apparatus Co., Inc.
Slaughter Co., Inc.
Telectro Industries Corp.
Westronics Inc.

Coincidence

Baird-Atomic, Inc.
Barnes Development Co.
Eldorado Electronics
Radiation Counter Labs., Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Crystal

Telectro Industries Corp.

Differential, Computer

Analogue Controls, Inc.
Baird-Atomic, Inc.
Consolidated Avionics Corp.
Electronic Associates, Inc.
Haller Raymond & Brown Inc.
Lumen, Inc.
Mid-Century Instrumatic Corp.
Reeves Instrument Corp.
Telectro Industries Corp.

Digital

Analogue Controls, Inc.
Austin Co., The, Special Devices Div.
Baird-Atomic, Inc.
Benson-Lehner Corp.
Consolidated Avionics Corp.
Edin Co., Inc.
Erie Resistor Corp.
Haller Raymond & Brown Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Dimensional

Clevalnd Instrument Co.
Telectro Industries Corp.

Distortion

Bendix Aviation Corp., York Div.
Boonton Electronics Corp.
Brush Instruments, Div.-Clevite Corp.
Empire Products Sales Corp.
Georator Corp.
Panoramic Radio Products, Inc.
Telectro Industries Corp.

Electro-Chemical

Baird-Atomic, Inc.
Bergen Labs.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Devco Engrg. Inc.
George L. Nankervis Co.
Polyphase Instrument Co.
Milton Roy Co.
Telectro Industries Corp.

Engine
Air Logistics Corp.
Electro Products Labs., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammett Electric Co.
George L. Nankervis Co.
*PACKARD-BELL ELECTRONICS CORP.
Sun Electric Corp.
Telectro Industries Corp.

Frequency
Adler Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., York Div.
Brush Instruments, Div.-Clevite Corp.
CGS Labs., Inc.
Consolidated Avionics Corp.
James Cunningham Son & Co., Inc.
Dynac, Inc.
Edin Co., Inc.
Eie Resistor Corp.
Fenske Fedrick & Miller Co.
Georator Corp.
Haller Raymond & Brown Inc.
Hammett Electric Co.
Kay Electric Co.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Panoramic Radio Products, Inc.
Sun Electric Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Varo Mfg. Co.

Ignition
Allegany Instrument Co., Inc.
*GREER HYDRAULICS, INC.
*PACKARD-BELL ELECTRONICS CORP.
Scintilla Div., Bendix Aviation Corp.
Sun Eelectric Corp.
Telectro Industries Corp.

Infrared
Baird-Atomic, Inc.
Greenbrier Instruments Inc.
Haller Raymond & Brown Inc.
Infrared Industries Inc.
Perkin-Elmer Corp.
Philco Corp., Government & Industrial Divs.
Telectro Industries Corp.

Intermodulation
Audio Instrument Co. Inc.
Empire Products Sales Corp.
Georator Corp.
Panoramic Radio Products, Inc.
Telectro Industries Corp.
Varo Mfg. Co.

Magnetic
Advance Industries, Inc.
J. W. Dice Co.
Keystone Products Co.
Lumen, Inc.
Rese Engrg., Inc.
Telectro Industries Corp.

Microwave
Adler Electronics, Inc.
Bendix Aviation Corp., York Div.
California Technical Industries, Div.-Textron Inc.
Demornay-Bonardi
Haller Raymond & Brown Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Northeast Electronics Corp.
Polarad Electronics Corp.
Ryan Aeronautical Co.
Stavid Engrg., Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.
Vectron, Inc.
Waveline, Inc.

Neutron Absorption
American Electronics, Inc.
Baird-Atomic, Inc.
Eldorado Electronics
Telectro Industries Corp.

Noise
Airborne Instruments Lab., Inc.
Brush Instruments, Div.-Clevite Corp.
Georator Corp.
Haller Raymond & Brown Inc.
Kay Electric Co.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Panoramic Radio Products, Inc.
Herman Hosmer Scott, Inc.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Western Electro-Acoustic Lab.

Phase
American Electronics, Inc., Data-Tronics Div.
Bendix Aviation Corp., York Div.
Brush Instruments, Div.-Clevite Corp.
Haller Raymond & Brown Inc.
North Atlantic Industries, Inc.
Panoramic Radio Products, Inc.
Ryan Aeronautical Co.
Telectro Industries Corp.
Varo Mfg. Co.
Wintronics

Spectrum
Applied Research Labs.
Baird-Atomic, Inc.
Brush Instruments, Div.-Clevite Corp.
Consolidated Electrodynamics Corp.
Demornay-Bonardi
Douglas Microwave Co., Inc.
Edin Co., Inc.
General Electric Co., Apparatus Sales Div.
Haller Raymond & Brown Inc.
Kay Electric Co.
Lavoie Labs., Inc.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Northeastern Engrg. Inc.
Panoramic Radio Products, Inc.
Perkin-Elmer Corp.
Polarad Electronics Corp.
Radiation Counter Labs., Inc.
Ryan Aeronautical Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Vectron, Inc.

Transducer
Cleveland Instrument Co.
Consolidated Airborne Systems, Inc.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Hagan Chemicals & Controls, Inc.
Haller Raymond & Brown Inc.
*WALLACE O. LEONARD, INC.
Massa Labs., Inc.
Orbitran Co., Inc.
Telectro Industries Corp.

Transistor
American Electronics, Inc.
Baird-Atomic, Inc
Barnes Development Co.
Consolidated Avionics Corp.
James Cunningham Son & Co., Inc.
Haller Raymond & Brown Inc.
Kay Electric Co.
Owen Labs., Inc.
Telectro Industries Corp.
Trans Electronics, Inc.
Ultradyne, Inc.

Ultrasonic
Acoustica Associates, Inc.
Alcar Instruments, Inc
Arenberg Ultrasonic Laboratory, Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div
Gulton Industries, Inc.
Kay Electric Co.
Massa Labs., Inc.
Narda Ultrasonics Corp., The
Panoramic Radio Products, Inc.
Telectro Industries Corp.

Vibration
Benson-Lehner Corp.
Brush Instruments, Div.-Clevite Corp.
Columbia Research Labs.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Epic, Inc.
Erwood Inc.
Georator Corp.
Insco Co., Div-Barry Controls Inc.
*KAHN & CO., INC.
Kay Electric Co.
MB Mfg. Co.
Magnasync Mfg. Co., Ltd.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Panoramic Radio Products, Inc.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Western Electro-Acoustic Lab.

Wave
Bendi Aviation Corp., York Div.
Benson-Lehner Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Georator Corp.
Haller Raymond & Brown Inc.
Kay Electric Co.
Minneapolis-Honeywell Regulator Co.
Panoramic Radio Products, Inc.
Railway Communications Inc.
Ryan Aeronautical Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
*TELERAD MFG. CORP.

Waveform
Adler Electronics, Inc.
Bendix Aviation Corp., York Div.
Benson-Lehner Corp.
Edin Co., Inc.
Georator Corp.
Haller Raymond & Brown Inc.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Panoramic Radio Products, Inc.
Spectrum Instruments, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.

ANEMOMETERS
Aero Research Instrument Co. Inc.
Beckman & Whitley, Inc.
Epic, Inc.
Flow Corp.
Friez Instrument Div.-Bendix Aviation Corp.
General Scientific Equipment Co.
Hammett Electric Co.
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
Northam Electronics, Inc.
Scientific Instrument Co.
Telectro Industries Corp.

ANNUNCIATORS
Haller Raymond & Brown Inc.
Optimized Devices, Inc.
Phaostron Instrument & Electronic Co.
Telectro Industries Corp.
United Control Corp.

ANTI-VIBRATION EQUIPMENT
Columbia Research Labs.
Joe Davidson & Associates
Epic, Inc.
General Cable Corp.
*HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.
Walter Kidde & Co., Inc., Aviation Div.
Ling Electronics Inc.
Robinson Aviation, Inc.
Rubbercraft Corp. of California
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co., The

ARSENIC
Accurate Specialties Co. Inc.
Belmont Smelting & Refining Works, Inc.
Bios Labs., Ins.
Bram Metallurgical & Chemical Co.

BALANCING EQUIPMENT
Aircraft Standards, Inc.
*COOPER DEVELOPMENT CORP.
Cosa Corp.
Decker Corp., The
Hammett Electric Co
Hickok Electrical Instrument Co., The
Hicks Corp., The
Micro Balancing, Inc.
Royal Industries, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg. Div., Warren Brothers Roads Co.
*WESTINGHOUSE ELECTRIC CORP.

BAROGRAPHS
Friez Instrument Div.-Bendix Aviation Corp.
Instruments Corp., The
Scientific Instrument Co.

BAROMETERS

Dynametrics Corp.
Friez Instrument Div.-Bendix Aviation Corp.
Hammett Electric Co.
Ideal Aerosmith, Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Scientific Instrument Co.
Strata Instrument Co.

BATTERIES, DRY CELL

Bright Star Industries
Burgess Battery Co.
Carbone Corp., The
***EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.**
Gudeman Co., The
P. R. Mallory & Co. Inc.

BATTERIES, LEAD-ACID

Bowers Battery & Spark Plug Co.
Electric Auto-Lite Co., The
***EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.**
Willard Storage Battery Div.

BELTS, DIAL DRIVE

A. T. Stevens Co.

BEZELS

American Brass Co., The
Hamilton Watch Co., Military Products Div.
Sohl Co., The

BIMETAL, THERMOSTATIC

American Silver Co.
Bram Metallurgical & Chemical Co.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Metals & Controls Corp.

BINDING POSTS

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Affiliated Screw Products Co.
Amatom Electronic Hardware Co. Inc.
Birnbach Radio Co., Inc.
Elco Corp.
Electro-Tech Equipment Co.
General Railway Signal Co.
Georator Corp.
***GRAPHITE METALLIZING CORP.**
E. F. Johnson Co.
Litton Industries, Components Div.

BOARDS, PLUG

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Electronic Techniques, Inc.
Elm Mfg. Co. Inc.
Emerson Plastics Corp.
General Railway Signal Co.
La Pointe Industries Inc.
Precision Circuits, Inc.
Vector Electronic Co.

BREADBOARD KITS, ELECTRONIC

Aerolite Electronics Corp.
Ainslie Corp.
Alden Products Co.
Associated Engineers, Inc.
Dunlap Electronics Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
La Pointe Industries Inc.
Munston Mfg. & Service, Inc.
PIC Design Corp., Sub.—Benrus Watch Co., Inc.
Pomona Electronics Co., Inc.
Servomechanisms, Inc., Mechatrol Div.
Specific Products
Stanley Aviation Corp.
Techniques, Inc.
Telectro Industries Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Vector Electronic Co.

BREAKERS, CIRCUIT

Cutler-Hammer Inc.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Metals & Controls Corp.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Multi-Amp Corp.
***WESTINGHOUSE ELECTRIC CORP.**

BRIDGES

Alpha Instrument Co.
B & F Instruments, Inc.
James G. Biddle Co
Cambridge Instrument Company, Inc.
Champion Airquipment Inc.
Dwyer Engrg. Co., Inc.
Electro-Measurements Inc.
Fenske Fedrick & Miller Co.
Georator Corp.
Gray Instrument Co.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Servonic Instruments, Inc.
Telectro Industries Corp.

BRUSHES, SOUND REPRODUCTION EQUIPMENT

Pure Carbon Co. Inc.

CABINETS, PLASTIC

Continental Diamond Fibre Corp., Sub.—The Budd Co.
***CRAIG SYSTEMS, INC.**
Dayton Aircraft Products, Inc.
Erie Resistor Corp.
Fischer & Porter Co.
Gardner Laboratory, Inc.
Jodee Plastics Co.
Paul & Beekman, Inc.
Star Engraving Co., Ltd.
Sylvania Electric Products Inc., Parts Div.
Thieblot Aviation Co., Div.-Vitro Corp. of America

CABINETS, TEMPERATURE TEST

Accessory Controls & Equipment Corp.
Advanced Electronics, Inc.
***AEROTEST LABORATORIES, INC.**
Aireco, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Associated Testing Labs., Inc.
Cincinnati Sub Zero Products
***CONRAD, INC.**
Environmental Equipment Co.
G. W. Galloway Co.
Guardite Co., Div. of American-Marietta Co.
Hallikainen Instruments
***KAHN & CO., INC.**
Missimers Inc.
Resdel Engrg. Corp.
***RYAN INDUSTRIES**
Scientific Instrument Co.
Standard Cabinet Co.
Sun Electric Corp.
Tenney Engrg., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg. Div., Warren Brothers Roads Co.
***WASHINGTON ALUMINUM CO., INC.**
Webber Engrg. Corp.

CABLE ASSEMBLIES

Advanced Electronics, Inc.
Aerolite Electronics Corp.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Airtron, Inc.
Alden Products Co.
Alpha Wire Corp.
American Electric Cable Co.
American Super-Temperature Wires, Inc.
Andrew Corp.
Arens Controls, Inc.
Automotive & Aircraft Div.-American Chain & Cable Co., Inc.
Belden Mfg. Co.
Bergen Wire Rope Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Bliss Electronic Corp.
William Brand & Co., Inc.
California Technical Industries, Div.-Tevtron Inc.
Centronix Inc.
Chester Cable Corp.
***COOPER DEVELOPMENT CORP.**
Dayton Aircraft Products, Inc.
Dwyer Engrg. Co., Inc.
Electric Auto-Lite Co., The
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Empire Electronics Co., Inc.
First Electronics Corp., The
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hackensack Cable Corp.
Hallett Mfg. Co.
Hi-Lo Manufacturing Corp.
Hitemp Wires, Inc.
Hoover Electronics Co.
Industrial Wiring & Cable Co.
International Electric Industries, Inc.
***KAHN & CO., INC.**
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Kilgen Aircraft Div.-The Kilgen Organ Co.
Methode Mfg. Corp.
Missile Engrg. Products, Inc.
Network Mfg. Corp.
Pacific Automation Products, Inc.
Packard Electric Div.-General Motors Corp.
Resdel Engrg. Corp.
Rex Corp., The
John A. Roeblings Sons Corp.
Rowe Industries
Schaffer Air Industries, Inc.
Sequoia Wire Co.
Sheltered Workshop
Surprenant Mfg. Co.
Telectro Industries Corp.
Thermax Wire Corp.
Tricraft Products Corp.
Tri-Dex Co.
Victor Electric Wire & Cable Corp.
Westbury Electronics Inc.
Western International Co.
Westwood Cable Corp.
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.
Wilmar Mfg. Co., Inc.

CABLE ASSEMBLIES

Food Machinery & Chemical Corp., Ordnance Div.
***NORMANDY ELECTRIC WIRE CORP.**
Winder Aircraft Corp. of Fla.
Wire Co. of America, Inc.
Zippertubing Co., The

CABLE

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Alden Products Co.
Alpha Wire Corp.
American Electric Cable Co.
***AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.**
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Arens Controls, Inc.
Belden Mfg. Co.
Bergen Wire Rope Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
William Brand & Co., Inc.
Copperweld Steel Co., Wire & Cable Div.
Electric Auto-Lite Co., The
General Cable Corp.
Georator Corp.
Hackensack Cable Corp.
Hallett Mfg. Co.
Hitemp Wires, Inc.
International Electric Industries, Inc.
Methode Mfg. Corp.
Mohawk Wire & Cable Corp.
Multi-Amp Corp.
***NORMANDY ELECTRIC WIRE CORP.**
Okonite Co., The
Pacific Automation Products, Inc.
Packard Electric Div.-General Motors Corp.
Peschel Electronics, Inc.
Phelps Dodge Copper Products Corp.
Plastoid Corp.
Rex Corp., The
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Victor Electric Wire & Cable Corp.
Western International Co.
Westwood Cable Corp.
Winder Aircraft Corp. of Fla.
Wire Co. of America, Inc.
Zippertubing Co., The

CALIBRATORS

Alpha Instrument Co.
Ballantine Labs., Inc.
Consolidated Electrodynamics Corp.
***COOPER DEVELOPMENT CORP.**
Dynac, Inc.
Dynametrics Corp.
Electric Auto-Lite Co., The
Fenske Fedrick & Miller Co.
Gertsch Products Inc.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Potter Aeronautical Corp.
Rese Engrg., Inc.
Telectro Industries Corp.
Telonic Industries, Inc.
Transformers, Inc.
Varo Mfg. Co.

CAMERA AUXILIARY EQUIPMENT

Benson-Lehner Corp.
Camerrflex Corp.
Dunlap Electronics, Inc.
Eastman Kodak Co.
Sherman Fairchild & Assoc. Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
***HAYWARD SCIENTIFIC GLASS CORP.**
Huber Industries, Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Reeves Instrument Corp.
Specialties, Inc.
Telectro Industries Corp.

CAMERA MOUNTS

Aircraft Standards, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Benson-Lehner Corp.
Cameraflex Corp.
G. M. Dykes Iron Works, Inc.
Sherman Fairchild & Assoc. Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
***FLIGHT RESEARCH, INC.**
Huber Industries, Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Reeves Instrument Corp.
Robinson Aviation, Inc.
Traid Corp.
Winder Aircraft Corp. of Fla.

CAMERAS

Allegany Instrument Co., Inc.
Barnes Development Co.
Beattie-Coleman, Inc.
Benson-Lehner Corp.
Eastman Kodak Co.
Electric Auto-Lite Co., The
Sherman Fairchild & Assoc. Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
***FLIGHT RESEARCH, INC.**
Haller Raymond & Brown Inc.
Houston Fearless Corp.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Librascope Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Perkin-Elmer Corp.
Traid Corp.
Wollensak Optical Co.

Data Recording

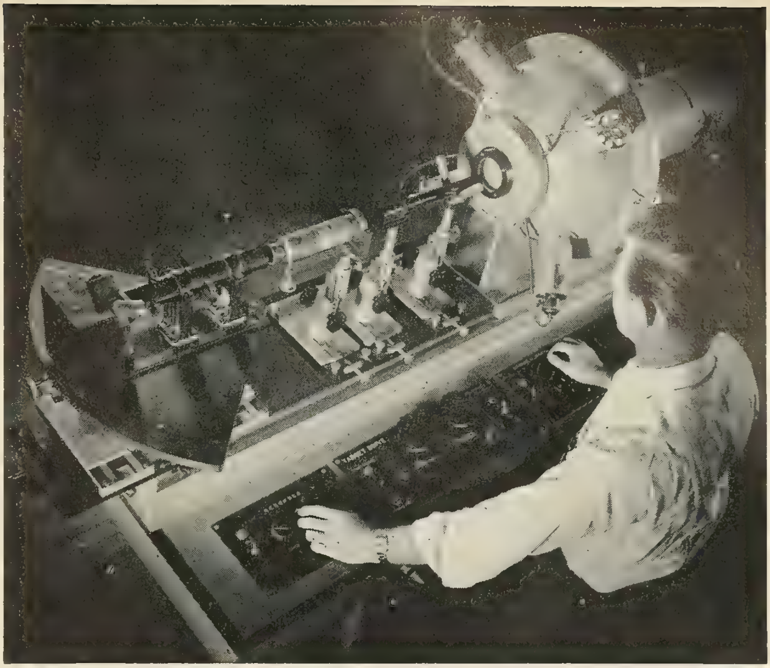
Abrams Instrument Corp.
Allegany Instrument Co., Inc.
American Electronics, Inc.
Barnes Development Co.
Beattie-Coleman, Inc.
Benson-Lehner Corp.
Cameraflex Corp.
Consolidated Electrodynamics Corp.
Edgerton, Germeshausen & Grier, Inc.
Sherman Fairchield & Assoc. Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
***FLIGHT RESEARCH, INC.**
Graflex, Inc.
Haller Raymond & Brown Inc.
Houston Fearless Corp.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Librascope Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Nemeth, Inc.
Optomechanisms Inc.
Perkin-Elmer Corp.
Reeves Instrument Corp.
Southwestern Industrial Electronics Co.
Traid Corp.
Wollensak Optical Co.

High Speed

Allegany Instrument Co., Inc.
Barnes Development Co.
Benson-Lehner Corp.
Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
Sherman Fairchild & Assoc. Inc.
Fairchild Camera & Instrument Corp., Industrial Camera Div.
***FLIGHT RESEARCH, INC.**
Georator Corp.
Haller Raymond & Brown Inc.
Librascope Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Traid Corp.
Wollensak Optical Co.

Oscilloscope

Allegany Instrument Co., Inc.
Beattie-Coleman, Inc.
Cameraflex Corp.
Edgerton, Germeshausen & Grier, Inc.
Electro-Medical Lab., Inc.



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Grass Instrument Co.
Haller Raymond & Brown Inc.
Houston Fearless Corp.
Land-Air Inc., Sub.—California Eastern Aviation Inc.
J. A. Maurer, Inc.
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Photomicrographics

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J. W. Fecker, Inc., Sub.—American Optical Co.
*FLIGHT RESEARCH, INC.
Haller Raymond & Brown Inc.
Houston Fearless Corp.
Land-Air, Inc., Sub.—California Eastern Aviation Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Traid Corp.
Specialties, Inc.
Wollensak Optical Co.

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Beattie-Coleman Inc.
Benson-Lehner Corp.
Cameraflex Corp.
J. W. Fecker, Inc., Sub.—American Optical Co.
*FLIGHT RESEARCH, INC.
Haller Raymond & Brown Inc.
Librascope Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Traid Corp.
Wollensak Optical Co.

X-Ray

Electric Auto-Lite Co., The
Instruments Div.-Philips Electronics, Inc.
Optomechanisms Inc.
St. John X-Ray Laboratory
Science House, Inc.

CELLS, PHOTOELECTRIC

Cambridge Instrument Company, Inc.
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General Electric Co., Apparatus Sales Div.
Haller Raymond & Brown Inc.
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Zenith Optical Laboratory

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TA Mfg. Corp.
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H. Braun Tool & Instrument Co., Inc.
Dumont Aviation Associates
Garde Mfg. Co.
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Kickhaefer Mfg. Co.
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Progressive Research & Development Co., Inc.
Reliable Spring & Wire Forms Co., The
TA Mfg. Corp.
Weckesser Co.

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Central Coil Co. Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
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E. F. Johnson Co.
Mar Vista Engrg. Co.
J. W. Miller Co.
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New York Coil Co., Inc.
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Precision, Inc.
Tele-Coil Co.
Warren Transformer Co., Inc.
Winatic Corp., The

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Instrument Development Laboratories, Inc.
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National Spectrographic Labs., Inc.
Photovolt Corp.
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Consolidated Controls Corp.
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M. Ten Bosch, Inc.
Thompson-Ramo-Wooldridge Products Co., The
United Control Corp.

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Chicago Div., American Bosch Arma Corp.
R. C. Dudek & Co.
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Scintilla Div., Bendix Aviation Corp.
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***KAHN & CO., INC.**
Leeds & Northrup Co.
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Patterson, Moos Div.-Universal Winding Co., Inc.
Servomechanisms, Inc.
Thompson-Ramo-Wooldridge Products Co., The

Alarm System

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Ellison Draft Gage Co.
Fischer & Porter Co.
***GREER HYDRAULICS, INC.**
***KAHN & CO., INC.**
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Thompson-Ramo-Wooldridge Products Co., The
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Vap-Air Div., Vapor Heating Corp.

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Industrial Instruments Inc.
Patterson, Moos Div.-Universal Winding Co., The
Thompson-Ramo-Wooldridge Products Co., The

Density

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CDC Control Services, Inc.
Curtiss-Wright Corp., Electronics Div.
Fischer & Porter Co.

Dimension

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CDC Control Services, Inc.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.

Film Thickness

CDC Control Services, Inc.
Curtiss-Wright Corp., Electronics Div.
J. W. Dice Co.
Electric Eye Equipment Co.
Nuclear Corp. of America, Inc.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.

Heat Treating

CDC Control Services, Inc.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
E. Vernon Hill & Co.
Leeds & Northrup Co.
Size Control Co.

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Driaire, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
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***KAHN & CO., INC.**
Leeds & Northrup Co.
Nuclear Corp. of America, Inc.
Powers Regulator Co., The
Scientific Instrument Co.
Universal Dynamics Corp.
Weighing & Control Components, Inc.
Wells Industries Corp.

Inspection

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CDC Control Services, Inc.
Cleveland Instrument Co.
Electric Eye Equipment Co.
Lumen, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
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Size Control Co.
Thompson-Ramo-Wooldridge Products Co., The

Materials Thickness

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Briggs Associates, Inc.
CDC Control Services, Inc.
Cleveland Instrument Co.
Curtiss-Wright Corp., Electronics Div.
Daytronic Corp.
J. W. Dice Co.
Electric Eye Equipment Co.
Gardner Laboratory, Inc.
***KAHN & CO., INC.**
Sheffield Corp., The, Sub.—Bendix Aviation Corp.
Size Control Co.
***WESTINGHOUSE ELECTRIC CORP.**

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American Brass Co., The
Belden Mfg. Co.
Birnbach Radio Co., Inc.
Electric Parts Corp.
Essex Mfg. Co., Inc.
General Cable Corp.
Hammett Electric Co.
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Kulka Electric Corp.
Royal Electric Corp.
Telectro Industries Corp.
Victor Electric Wire & Cable Corp.
Waldom Electronics Inc.
Western International Co.
Westwood Cable Corp.

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Automatic Electric Sales Corp.
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Cameraflex Corp.
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Streeter-Amet Co.
Systron Corp.
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Thompson-Ramo-Wooldridge Products Co., The
Veeder-Root Inc.
Wacline, Inc.
Walkirt Co.

Computer

Baird-Atomic, Inc.
Bendix Aviation Corp., York Div.
Bowmar Instrument Corp.
Burroughs Corp.
Consolidated Avionics Corp.
Dynac, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Exact Engrg. & Mfg. Inc.
Haller Raymond & Brown Inc.
Librascope Inc.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
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Soroban Engrg., Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
Walkirt Co.

Electro-Magnetic

Abrams Instrument Corp.
Baird-Atomic, Inc.
Bowmar Instrument Corp.
Burroughs Corp.
Durant Mfg. Co.
Electro-Tech Equipment Co.
Exact Engrg. & Mfg. Co.
General Controls Co.
Haller Raymond & Brown Inc.
Librascope Inc.
Nemeth, Inc.
Photocon Research Products
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Streeter-Amet Co.
Talley Corp., The
Telectro Industries Corp.
Veeder-Root Inc.

Electronic

Advance Industries, Inc.
Baird-Atomic, Inc.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Cameraflex Corp.
Centronix Inc.
Computer-Measurements Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Dunlap Electronics, Inc.
Durant Mfg. Co.
Dynac, Inc.
Eldorado Electronics
Electronic Associates, Inc.
Electronic Control Corp.
Electronic Engrg. Co. of California
Electronics Corp. of America
Electro-Pulse, Inc.
Erie Resistor Corp.
Exact Engrg. & Mfg. Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hamner Electronics Co., Inc.
Hupp Instrumation, Div.—Erie Pacific
I-L-S Instrument Corp.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Northeastern Engrg. Inc.
Photobell Co., Inc.
Potter Aeronautical Corp.
Skiatron Electronics & Television Corp.
Systron Corp.
Telectro Industries Corp.
Varo Mfg. Co.
Walkirt Co.

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M. Ducommun Co.
Electro-Tech Equipment Co.
Exact Engrg. & Mfg. Inc.
Nemeth, Inc.
Skiatron Electronics & Television Corp.
Systron Corp.
Telectro Industries Corp.
Veeder-Root Inc.
Walkirt Co.

Frequency

Computer-Measurements Corp.
Consolidated Avionics Corp.
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Dynac, Inc.
Electro-Pulse, Inc.
Epsco Inc.
Erie Resistor Corp.
Haller Raymond & Brown Inc.
Hupp Instrumation, Div.—Erie-Pacific
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Laboratory for Electronics, Inc.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Nemeth, Inc.
Ernest Norrman Laboratories
Northeastern Engrg. Inc.
Potter Aeronautical Corp.
Skiatron Electronics & Television Corp.
Systron Corp.
Telectro Industries Corp.
Varo Mfg. Co.
Veeder-Root Inc.
Wacline, Inc.
Walkirt Co.

Impulse

Abrams Instrument Corp.
Automatic Electric Sales Corp.

Baird-Atomic, Inc.
Bowmar Instrument Corp.
Cameraflex Corp.
Computer-Measurements Corp.
Digitran Co., The
Dynac, Inc.
Electronic Associates, Inc.
Electro-Tech Equipment Co.
Epsco Inc.,
Erie Resistor Corp.
Exact Engrg. & Mfg. Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hamilton Watch Co., Military Products Div.
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Photocon Research Products
Skiatron Electronics & Television Corp.
Streeter-Amet Co.
Systron Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Veeder-Root Inc.
Walkirt Co.

Mechanical

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Baird-Atomic, Inc.
Bowmar Instrument Corp.
Digitran Co., The
Durant Mfg. Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electro-Tech Equipment Co.
Exact Engrg. & Mfg. Inc.
General Controls Co.
General Railway Signal Co.
Hamilton Watch Co., Military Products Div.
Kearfott Co., Inc.
Librascope Inc.
Nemeth, Inc.
Photocon Research Products
Skiatron Electronics & Television Corp
Talley Corp., The
Technical Oil Tool Corp.
Telectro Industries Corp.
Veeder-Root Inc.

Preset

Abrams Instrument Corp.
Baird-Atomic, Inc.
Bowmar Instrument Corp.
Burroughs Corp., Electronic Tube Div.
Computer-Measurements Corp.
Consolidated Avionics Corp.
Durant Mfg. Co.
Dynac, Inc.
Electro-Pulse, Inc.
Electro-Tech Equipment Co.
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Industrial Electronic Engineers
Nemeth, Inc.
Northeastern Engrg. Inc.
Photocon Research Products
Potter Aeronautical Corp.
Skiatron Electronics & Television Corp.
Streeter-Amet Co.
Systron Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Veeder-Root Inc.
Walkirt Co.

Proportional

Baird-Atomic, Inc.
Bowmar Instrument Corp.
Coleman Engrg. Co., Inc.
Dynac, Inc.
Eact Engrg. & Mfg. Inc.
Instruments Div.-Philips Electronics, Inc.
Lumen, Inc.
Nemeth, Inc.
Nuclear-Chicago Corp.
Nuclear Measurements Corp.
Potter Aeronautical Corp.
Radiation Counter Labs., Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Veeder-Root Inc.

Radiation

Baird-Atomic, Inc.
Eldorado Electronics
Gerard G. Leeds Co., Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
St. John X-Ray Laboratory
Skiatron Electronics & Television Corp.
Systron Corp.
Telectro Industries Corp.
Veeder-Root Inc.

Revolution

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Digitran Co., The
Durant Mfg. Co.
Dynac, Inc.
Electro-Tech Equipment Co.
Exact Engrg. & Mfg. Inc.
General Controls Co.
Hupp Instrumation, Div.—Erie-Pacific
Nemeth, Inc.
Photocon Research Products
Potter Aeronautical Corp.
Skiatron Electronics & Television Corp.
Streeter-Amet Co.
Telectro Industries Corp.
Uniwave, Inc.
Veeder-Root Inc.
Wacline, Inc.
Walkirt Co.

Scintillation

American Electronics, Inc.
Baird-Atomic, Inc.
Fisher Research Lab., Inc.
Hamner Electronics Co., Inc.
Instruments Div.-Philips Electronics, Inc.
Gerard G. Leeds Co., Inc.
Moran Instrument Corp.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Skiatron Electronics & Television Corp.
Systron Corp.
Telectro Industries Corp.

CRYSTAL ANALYSIS EQUIPMENT

Barnes Development Co.
McCoy Electronics Co.
Specific Products

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Sesco Mfg., Inc.
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Arenberg Ultrasonic Laboratory, Inc.
Bliley Electric Co.
Richard D. Brew & Co., Inc.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Central Coil Co. Inc.
Digitronics Corp.
ESC Corp.
Epsco Inc.
Georator Corp.
Laboratory for Electronics, Inc.
NYT Electronics, Inc.
Redman Electronics Corp.
Stewart-Warner Corp.
Telectro Industries Corp.
Tobe Deutschmann Corp.
Tucson Instrument Corp.
Western Coil Products Co.

DENSITOMETERS, ELECTRONIC

***AMERICAN MACHINE & FOUNDRY CO.**
Applied Research Labs.
Baird-Atomic, Inc.
Eldorado Electronics
Ess Instrument Co.
Gerard G. Leeds Co., Inc.
Liquidometer Corp., The
Perkin-Elmer Corp.
Photovolt Corp.
Potter Aeronautical Corp.
Research Appliance Co.

DETECTION SYSTEMS

Arnoux Corp.
Atlantic Research Corp.
Baird-Atomic, Inc.
Browning Laboratories, Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
General Nuclear Corp.
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Optomechanisms Inc.
Potter Aeronautical Corp.
Radiation Counter Labs., Inc.
Ryan Aeronautical Co.
Thompson-Ramo-Wooldridge Products Co., The

DETECTORS

Arnoux Corp.
Consolidated Electrodynamics Corp.
***KAHN & CO., INC.**
Jas. P. Marsh Corp.
Perkin-Elmer Corp.

Crack

Curtiss-Wright Corp., Industrial & Scientific Products Div.
Menlo Research Lab.

Crystal

Baird-Atomic, Inc.
Demornay-Bonardi
Radar Design Corp.
Reeves-Hoffman Div.
Ryan Aeronautical Co.
Telonic Industries, Inc.

Detonation

Patterson, Moos Div.-Universal Winding Co., Inc.

Explosive Gas

Electron-Radar Products
Electronics Corp. of America
General Electric Co., Apparatus Sales Div.
General Scientific Equipment Co.
***GREER HYDRAULICS, INC.**
Johnson-Williams, Inc.
Mine Safety Appliances Co.
Patterson-Moos Div.-Universal Winding Co., Inc.

Fire

Arnoux Corp.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
J. Bishop & Co. Platinum Works
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electron-Radar Products
Electronics Corp. of America
Fenwal Inc.
Hoffman Electronics Corp., Semiconductor Div.
Infrared Industries Inc.
Walter Kidde & Co., Inc., Aviation Div.

Flaw and Defect, Electronic

J. W. Dice Co.

Gas

Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Devco Engrg. Inc.
Electron-Radar Products
Electronics Corp. of America
General Electric Co., Apparatus Sales Div.
General Scientific Equipment Co.
Greenbrier Instruments Inc.
***GREER HYDRAULICS, INC.**
Mine Safety Appliances Co.
Perkin-Elmer Corp.

Impedance

Microwave Electronics Div., Sperry Gyroscope Co.
Sun Electric Corp.

Leak

Accessory Controls & Equipment Corp.
American Electronics, Inc.
Consolidated Electrodynamics Corp.
Fisher Research Lab., Inc.
E. Vernon Hill & Co.
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
NRC Equipment Corp.
Oxygen Equipment & Service Co.
Perkin-Elmer Corp.
Potter Aeronautical Corp.
Veeco Vacuum Corp.

Metal, Electronic

Barnes Development Co.
J. W. Dice Co.
Electro Products Labs., Inc.
Fisher Research Lab., Inc.
Indiana Steel Products Co., Inc.
Potter Aeronautical Corp.

Magnetic

Advance Industries, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**

Monoxide

Cambridge Instrument Company, Inc.

Radiation

American Electronics, Inc.
Baird-Atomic, Inc.
Barnes Engineering Co.
Curtiss-Wright Corp., Electronics Div.
Fisher Research Lab., Inc.
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
Infrared Industries Inc.
Landsverk Electrometer Co.
Menlo Research Lab.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
St. John X-Ray Laboratory
Stanley Aviation Corp.
*WESTINGHOUSE ELECTRIC CORP.

DETECTORS

Alto Scientific Co., Inc.
Arnoux Corp.
Associated Research, Inc.
Barnes Development Co.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
*KAHN & CO., INC.
Perkin-Elmer Corp.
Reeves Instrument Corp.
Wacline, Inc.

Resistance

Amelco, Inc.
Arnoux Corp.
Associated Research, Inc.
Barnes Development Co.
California Technical Industries, Div.-Textron Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Multi-Amp Corp.
Reeves Instrument Corp.
T-C Div., Dyna-Empire, Inc.

Standing Wave

Alto Scientific Co., Inc.
Browning Laboratories, Inc.
California Technical Industries, Div.-Textron Inc.
Demornay-Bonardi
Electro Impulse Lab., Inc.
Georator Corp.
Hycon Eastern Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Northeast Electronics Corp.
Omega Labs., Inc.
Sage Laboratories, Inc.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.

Vibration

Advanced Electronics, Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Atlantic Reserach Corp.
Cambridge Instrument Company, Inc.
Chesapeake Instrument Corp.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Georator Corp.
*KAHN & CO., INC.
MB Mfg. Co.
Massa Labs., Inc.
Perkin-Elmer Corp.
Herman Hosmer Scott, Inc.
Tel-Instrument Electronics Corp.

Voltage

Alto Scientific Co., Inc.
Associated Research, Inc.
Davenport Mfg. Co.
Georator Corp.
Multi-Amp Corp.
Slaughter Co., Inc.
Wacline, Inc.

Waterleak

*KAHN & CO., INC.
Menlo Research Lab.
Potter Aeronautical Corp.

DIALS

Ackerman Engravers, Inc.
Acromark Co., The
Allied Engraving & Stamping Co.
Borg Equipment Div.-The George W. Borg Corp.
Canadian Radium & Uranium Corp.
Eljay Corp.
Emerson Plastics Corp.
Etched Products Corp.
Georator Corp.
Hamilton Watch Co., Military Products Div.
Jodee Plastics Co.
E. F. Johnson Co.
Lancaster Glass Corp.
Lytle Engrg. & Mfg. Co.
Print Loid, Inc.
Sohl Co., The
Spartan Marking Corp.
Star Engraving Co., Ltd.
Techniques, Inc.
United States Radium Corp.
Universal Unlimited, Inc.
Virginia Plak Co.
Waldom Electronics Inc.

DIODES

Bendix Aviation Corp., Red Bank Div.
Bios Labs., Inc.
Bogue Electric Mfg. Co.
Clevite Transistor Products, Div.-Clevite Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Gahagan Inc.
Green Rectifier Co.
Hammett Electric Co.
Terminal Radio Corp.

Crystal

Bios Labs., Inc.
Clevite Transistor Products, Div.-Clevite Corp.
Hammett Electric Co.
Philco Corp., Government & Industrial Divs.
Reeves-Hoffman Div.
Terminal Radio Corp.

Germanium

Bendix Aviation Corp., Red Bank Div.
Bios Labs., Inc.
CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Clevite Transistor Products, Div.-Clevite Corp.
Gahagan Inc.
Hammett Electric Co.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Microwave Mixer

Demornay-Bonardi
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Gahagan Inc.
Georator Corp.
Hammett Electric Co.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Silicon

Bios Labs., Inc.
Bogue Electric Mfg. Co.
Bradley Labs.
CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Clevite Transistor Products, Div.-Clevite Corp.
Fansteel Metallurgical Corp.
Green Rectifier Co.
Hammett Electric Co.
Helipot Corp.
Hoffman Electronics Corp., Semiconductor Div.
Philco Corp., Government & Industrial Divs.
Sarkes Tarzian, Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Silicon Power

Bios Labs., Inc.
Bogue Electric Mfg. Co.
Bradley Labs.
Fansteel Metallurgical Corp.
Green Rectifier Co.
Hammett Electric Co.
Hoffman Electronics Corp., Semiconductor Div.
Sarkes Tarzian, Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

DISCRIMINATORS

Airtron, Inc.
Amelco, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
*COOPER DEVELOPMENT CORP.
D & R, Ltd.
*DATA-CONTROL SYSTEMS INC.
Dwyer Engrg. Co., Inc.
Epsco Inc.
General Railway Signal Co.
Librascope Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Polarad Electronics Corp.
Ryan Aeronautical Co.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.

DOSIMETERS

*AMERICAN MACHINE & FOUNDRY CO.
*ANTON ELECTRONIC LABS., INC.
Cambridge Instrument Company, Inc.
Landsverk Electrometer Co.
Menlo Research Lab.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
St. John X-ray Laboratory
Telectro Industries Corp.
Terminal Radio Corp.

DRIVERS, RECORDING

Baird-Atomic, Inc.
Exact Engrg. & Mfg. Inc.
Varo Mfg. Co.

DRIVES, SMALL ELECTRIC DRIVE MECHANISMS

Arch Gear Works Inc.
Bowmar Instrument Corp.
Joe Davidson & Associates
Eclipse-Pioneer Div., Bendix Aviation Corp.
Elm Mfg. Co. Inc.
Exact Engrg. & Mfg. Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hamilton Watch Co., Military Products Div.
*A. W. HAYDON CO., THE
Kearfott Co., Inc.
La Pointe Industries Inc.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Lyndon Aircraft, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Varo Mfg. Co.
Wacline, Inc.

DRIVES, TACHOMETER

Arch Gear Works Inc.
Exact Engrg. & Mfg. Inc.
*A. W. HAYDON CO., THE
I-L-S Instrument Corp.
Kearfott Co., Inc.
Potter Aeronautical Corp.
Servomechanisms, Inc., Mechatrol Div.
United Mfg. Co. Div., The W. L. Maxson Corp.
Uniwave, Inc.
Varo Mfg. Co.
Wacline, Inc.

ENAMEL, INSULATION

Vorac Co., The

FLOWMETERS, DIFFERENTIAL PRESSURE

Dynametrics Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hagan Chemicals & Controls, Inc.
Hickok Electrical Instrument Co., The
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
*WALLACE O. LEONARD, INC.
George L. Nankervis Co.
Systron Corp.
Trimount Instrument Co.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.

FLOWMETERS, VOLUMETRIC

Brooks Rotameter Co.
Dynametrics Corp.
G. W. Galloway Co.
Hallikainen Instruments
Hickok Electrical Instrument Co., The
Librascope Inc.
W. L. Maxson Corp., The
J. J. Monaghan Co., Inc.
George L. Nankervis Co.
Nuclear Corp. of America, Inc.
Potter Aeronautical Corp.
Systron Corp.
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Waugh Engrg. Co.

FLUOROMETERS

Epic, Inc.
Jarrell-Ash Co.
Ultra-Violet Products, Inc.

FLUXMETERS

Cambridge Instrument Company, Inc.
Epic, Inc.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Perkin-Elmer Corp.
Rese Engrg., Inc.

FORCE MEASURING CELLS

Dynametrics Corp.
Task Corp.

FREQUENCY CALIBRATION SERVICES

Demornay Bonardi
George L. Nankervis Co.
Varo Mfg. Co.

GALVANOMETERS

Assembly Products Inc.
James G. Biddle Co.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
J. A. Maurer, Inc.
Meters Inc.
Offner Electronics Inc.
Owen Labs., Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Sanborn Co.

GAS ANALYZERS

Applied Research Labs.
Baird-Atomic Inc.
Barton Instrument Corp.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
General Electric Co., Apparatus Sales Div.
Greenbrier Instruments Inc.
Hallikainen Instruments
Leeds & Northrup Co.
Victory Engineering Corp.

GAUGES

Atlantic Research Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Dill Mfg. Co., The
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Glassco Instrument Co.
Herrick L. Johnston, Inc.
Jas. P. Marsh Corp.
U. S. Gauge Div.-American Machine & Metals Inc.
Weksler Instrument Corp.

Air Pressure

Bridgeport Brass Co.
Consolidated Controls Corp.
Dill Mfg. Co., The
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp
Gits Brothers Mfg. Co.
Glassco Instrument Co.
Hagan Chemicals & Controls, Inc
E. Vernon Hill & Co.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Scientific Instrument Co.
Servomechanisms, Inc.
Servonic Instruments, Inc.
U. S. Gauge Div.-American Machine & Metals Inc.
Weksler Instrument Corp.

Compression

W. C. Dillon & Co., Inc.
Dynamic Instrument Co., Inc.
Glassco Instrument Co.
U. S. Gauge Div.-American Machine & Metals Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Weksler Instrument Corp.

Differential Pressure

Barton Instrument Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Decker Corp., The
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp
Glassco Instrument Co.
Hagan Chemicals & Controls, Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Northam Electronics, Inc.
Scientific Instrument Co.
Servonic Instruments, Inc.
Trimount Instrument Co.
Ultradyne, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Weksler Instrument Corp.

Fuel Pressure

Barton Instrument Corp.
J. Bishop & Co. Platinum Works
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Fischer & Porter Co.
Gilmore Industries Inc.
Glassco Instrument Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Scientific Instrument Co.
Servonic Instruments, Inc.
U. S. Gauge Div.-American Machine & Metals Inc.
Weksler Instrument Corp.

Fuel Quantity

Acoustica Associates Inc
Avien, Inc.
Barton Instrument Corp.
Boston Auto Gage Co., The
Dynametrics Corp.
Electric Auto-Lite Co., The
Fischer & Porter Co.
Gilmore Industries Inc.
Liquidometer Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
George L. Nankervis Co.
***ROCHESTER MFG. CO. INC.**
Simmonds Aerocessories, Inc.
U. S. Gauge Div.-Amberican Machine & Metals, Inc.
Waugh Engrg. Co.

Hydraulic Pressure

Atlantic Research Corp.
J. Bishop & Co. Platinum Works
Consolidated Controls Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Gilmore Industries Inc.
Glassco Instrument Co.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Scientific Instrument Co.
Servonic Instruments, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Weksler Instrument Corp.

Liquid Level

Acoustica Associates, Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Auburn Spark Plug Co., Inc.
Avien, Inc.
Barton Instrument Corp.
Boston Auto Gage Co., The
Dynametrics Corp.
Fischer & Porter Co.
Gilmore Industries Inc.
Hagan Chemicals & Controls, Inc.
Herrick L. Johnston, Inc.
Liquidometer Corp., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Narda Ultrasonics Corp., The
Northam Electronics, Inc.
***PENBERTHY MFG. CO.**
***REPUBLIC MFG. CO.**
***ROCHESTER MFG. CO. INC.**
Simmonds Aerocessories, Inc.
Trimount Instrument Co.
U. S. Gauge Div.-American Machine & Metals, Inc.

Manifold Pressure

Dynamic Instrument Co., Inc.
Gilmore Industries Inc.
Glassco Instrument Co.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Servonic Instruments Inc
U. S. Gauge Div.-American Machine & Metals Inc.

Oil Level

Acoustica Associates, Inc.
Barton Instrument Corp.
Boston Auto Gage Co., The
Electric Auto-Lite Co., The
Liquidometer Corp., The
***REPUBLIC MFG. CO.**
***ROCHESTER MFG. CO. INC.**
Simmonds Aerocessories, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

Oil Pressure

Barton Instrument Corp.
Consolidated Controls Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Fischer & Porter Co.
Glassco Instrument Co.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
Servonic Instruments, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Weksler Instrument Corp.

Outside Air Temperature

Avien, Inc.
J. Bishop & Co. Platinum Works
Illinois Testing Laboratories, Inc.
***ROCHESTER MFG. CO. INC.**
Royco Instruments
Scientific Instrument Co.
Weksler Instrument Corp.

Pressure

Barton Instrument Corp.
Brush Instruments, Div.-Clevite Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
W. C. Dillon & Co., Inc.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Fischer & Porter Co.
Glassco Instrument Co.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Northam Electronics, Inc.
Photocon Research Products
***ROCHESTER MFG. CO. INC.**
Scientific Instrument Co.
Servomechanisms, Inc.
Servonic Instruments, Inc.
Ultradyne, Inc.
U. S. Gauge Div.-American Machine & Metals Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Weksler Instrument Corp.

Quantity

Liquidometer Corp., The
***ROCHESTER MFG. CO. INC.**
Simmonds Aerocessories, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

Strain

Brush Instruments, Div.-Clevite Corp.
Columbia Research Labs.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Daytronic Corp.
W. C. Dillon & Co., Inc.
Dynamic Instrument Co., Inc.
General Electric Co., Apparatus Sales Div.
Gilmore Industries Inc.
Industrial Control Co.

Suction

Acme Industrial Co.
Consolidated Controls Corp.
Dynamic Instrument Co., Inc.
Northam Electronics, Inc.
***ROCHESTER MFG. CO. INC.**
U. S. Gauge Div.-American Machine & Metals, Inc.
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**

Torque Pressure

Brush Instruments, Div.-Clevite Corp.
Consolidated Controls Corp.
W. C. Dillon & Co., Inc.
Dynametrics Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Gilmore Industries Inc.
***ROCHESTER MFG. CO. INC.**
U. S. Gauge Div.-American Machine & Metals, Inc.

GAUSSMETERS

Advance Industries, Inc.
Cambridge Instrument Company, Inc.
Electro-Tech Equipment Co.
Hickok Electrical Instrument Co., The
Librascope Inc.
Magnetic Shield Div.-Perfection Mica Co.
Perkin-Elmer Corp.
T-C Div., Dyna-Empire, Inc.

GENERATORS, TIMING MARKER

Burr-Brown Research Corp.
Electro Products Labs., Inc.
Orbitran Co., Inc.
Ralph M. Parsons Co., The, Electronics Div.
Textran Corp.

GEOPHYSICAL APPARATUS

Benson-Lehner Corp.
Georator Corp.

GRILLS, SPEAKER

Flock Proces Co. Inc.
Telectro Industries Corp.

HARNESSES, ELECTRIC

Advanced Electronics, Inc.
Aerolite Electronics Corp.
Alden Products Co.
Amelco, Inc.
***AMERICAN MACHINERY & FOUNDRY CO.**
American Super-Temperature Wires, Inc.
Anchor Specialty Mfg. Co., Inc.
Beaton & Corbin Mfg. Co., The
Bliss Electronic Corp.
William Brand & Co., Inc.
California Technical Industries, Div.-Textron Inc.
***COOPER DEVELOPMENT CORP.**
Dayton Aircraft Products, Inc.
Dwyer Engrg. Co., Inc.
Electric Auto-Lite Co., The
Electric Parts Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Empire Electronics Co., Inc.
First Electronics Corp., The
Gudebrod Bros. Silk Co., Inc.
Hallett Mfg. Co.
Hammett Electric Co.
Harco Labs., Inc.
Industrial Wiring & Cable Co.
International Electronic Industries, Inc.
***KAHN & CO., INC.**
Kilgen Aircraft Div.-The Kilgen Organ Co.
Lytle Engrg. & Mfg. Co.
Packard Electric Div.-General Motors Corp.
Republic Aviation Corp., Guided Missiles Div.
Resdel Engrg. Corp.
Rowe Industries
Schaffer Air Industries, Inc.
Servicair Co.
Skytronics
Suprenant Mfg. Co.
Telectro Industries Corp.
Tri-Dex Co.
Tucson Instrument Corp.
Westbury Electronics Inc.

HEADS, COMPUTER

Soroban Engrg., Inc.
Telectro Industries Corp.

INDICATORS

Advanced Products Co., The
Arnoux Corp.
Barnes Development Co.
Barton Instrument Corp.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Dynac, Inc.
Electric Auto-Lite Co., The
Electro-Measurements Inc.
***GARRETT CORP., THE AIRESEARCH MFG. DIVS.**
General Railway Signal Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Hickok Electrical Instrument Co., The
***KAHN & CO., INC.**
Leeds & Northrup Co.
Milman Engrg. Co.
Reeves Instrument Corp.
Milton Roy Co.
U. S. Gauge Div.-American Machine & Metals, Inc.
Wacline, Inc.

Arc Back

Walkirt Co.

Arc-Over

Consolidated Airborne Systems, Inc.

Capacitor Leakage

Barnes Development Co.
Peschel Electronics, Inc.

Detonation Indicators & Meters

Patterson, Moos Div.-Universal Winding Co., Inc.

Deviation

Consolidated Airborne Systems, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Hickok Electrical Instrument Co., The
Varo Mfg. Co.

Dew Point

Electron-Radar Products
Hickok Electrical Instrument Co., The
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
Instruments Corp., The
***KAHN & CO., INC.**
Milton Roy Co.
Scientific Instrument Co.
Wells Industries Corp.

Dielectric Constant

Consolidated Airborne Systems, Inc.
Davenport Mfg. Co.
Hickok Electrical Instrument Co., The
Slaughter Co., Inc.

Dive Angle

Coleman Engrg. Co., Inc.
Hickok Electrical Instrument Co., The
Kearfott Co., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.

Drift

***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Kearfott Co., Inc.

Engine Synchronizer

Electro Products Labs., Inc.

Fluid Conductivity

Hickok Electrical Instrument Co., The
Industrial Instruments Inc.

Fluid Flow, Electronic

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Avien, Inc.
Barton Instrument Corp.
Computer-Measurements Corp.
Consolidated Airborne Systems, Inc.
Crescent Engrg. & Research Co.
Fischer & Porter Co.
Flow Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hickok Electrical Instrument Co., The
George L. Nankervis Co.
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautics Corp.
Waugh Engrg. Co.

Frequency

Computer-Measurements Corp.
Dynac, Inc.
Erie Resistor Corp.
Helipot Corp.
Hickok Electrical Instrument Co., The
Potter Aeronautics Corp.
***TELERAD MFG. CORP.**
Varo Mfg. Co.
Wacline, Inc.
Walkirt Co.
Waugh Engrg. Co.
Westronics Inc.

Fuel Flow Rate

Acoustica Associates, Inc.
Aero Supply Mfg. Co., Inc.
Avien, Inc.
Barton Instrument Corp.
Brooks Rotameter Co.
Dynac, Inc.
Electro Products Labs., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fischer & Porter Co.
Hickok Electrical Instrument Co., The
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
George L. Nankervis Co.
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautics Corp.
Systron Corp.
Waugh Engrg. Co.

Fuel Mixture

Acoustica Associates, Inc.
Fischer & Porter Co.

Ground Position

Kearfott Co., Inc.
Ryan Aeronautical Co.
Stromberg-Carlson, Electronics Div.

Gyro

Exact Engrg. & Mfg. Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hamilton Watch Co., Military Products Div.
Kearfott Co., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
***OPTO-METRIC TOOLS, INC.**
Reeves Instrument Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Humidity

Driaire, Inc.
Electron-Radar Products
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Scientific Equipment Co.
E. Vernon Hill & Co.
Industrial Instruments Inc.
Instruments Corp., The
***KAHN & CO., INC.**
Leeds & Northrup Co.
Scientific Instrument Co.
Universal Dynamics Corp.
Weksler Instrument Corp.
Wells Industries Corp.

Illumination

Electron-Radar Products
Hickok Electrical Instrument Co., The
Star Engraving Co., Ltd.

Industrial

Cleveland Instrument Co.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Ellison Draft Gage Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
***OPTO-METRIC TOOLS, INC.**
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.

Instrument Landing System

Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Railway Signal Co.
Marion Electrical Instrument Co.
Master Specialties Co.
Ryan Aeronautical Co.

Magnetic Field

Magnetic Shield Div.-Perfection Mica Co.

Materials Thickness

Amthor Testing Instrument Co., Inc.
Cleveland Instrument Co.
Daytronic Corp.
J. W. Dice Co.
Photocon Research Products

Moisture, Electronic

Consolidated Airborne Systems, Inc.
Consolidated Electrodynamics Corp.
Electron-Radar Products
***KAHN & CO., INC.**
Moisture Register Co.

Moving Target

Exact Engrg. & Mfg. Inc.
Laboratory for Electronics, Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Stromberg-Carlson, Electronics Div.

Null

Ballantine Labs., Inc.
Barnes Development Co.
Boonton Electronics Corp.
Computer Instruments Corp.
Electro-Measurements Inc.
Georator Corp.
Gertsch Products Inc.
Gray Instrument Co.
North Atlantic Industries, Inc.
Leeds & Northrup Co.
Marion Electrical Instrument Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Optimized Devices, Inc.
Herman Hosmer Scott, Inc.
Trio Laboratories, Inc.
Varo Mfg. Co.
Wacline, Inc.

Null-Balance, Potentiometer Type

Avien, Inc.
Barnes Development Co.
Consolidated Airborne Systems, Inc.
Gilmore Industries Inc.
North Atlantic Industries, Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Research Appliance Co.
Simmonds Aerocessories, Inc.

Oxygen

Air Products, Inc.
Aro Equipment Corp., The
Bergen Labs.
Ellison Draft Gage Co.
Pioneer-Central Div., Bendix Aviation Corp.

PH

Cambridge Instrument Company, Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photovolt Corp.

Plan Position

Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.

Photographic Exposure

Edgerton, Germeshausen & Grier, Inc.
General Electric Co., Apparatus Sales Div.
Optomechanisms Inc.
Wollensak Optical Co.

Pressure

Computer Instruments Corp.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
W. C. Dillon & Co., Inc.
Dynamic Instrument Co., Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Ellison Draft Gage Co.
Endevco Corp.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Controls Co.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hagan Chemicals & Controls, Inc.
Leeds & Northrup Co.
Mercury International Industries Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Northam Electronics, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Photocon Research Products
Scientific Instrument Co.
Trimount Instrument Co.
U. S. Gauge Div.-American Machine & Metals, Inc.
Weksler Instrument Corp.

Proximity

Barnes Development Co.
Electro Products Labs., Inc.
Ralph M. Parsons Co., The, Electronics Div.
Philco Corp., Government & Industrial Divs.
Photocon Research Products
Stanley Aviation Corp.

Pulse Time Riser

Consolidated Avionics Corp.

Radiation

American Electronics, Inc.
Baird-Atomic, Inc.
Curtiss-Wright Corp., Electronics Div.
General Electric Co., Apparatus Sales Div.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
St. John X-ray Laboratory

Radiation, Nuclear

American Electronics, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Jordan Electronics, Div.-Victoreen Instrument Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
St. John X-ray Laboratory
Stanley Aviation Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Rate-Of-Climb

Kearfott Co., Inc.
***WALLACE O. LEONARD, INC.**
Textran Corp.

Recording Engine

***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**

RF Probe

Boonton Electronics Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Wacline, Inc.

Remote

Analogue Controls, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Exact Engrg. & Mfg. Inc.
***A. W. HAYDON CO., THE**
Kearfott Co., Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
***UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.**
Varo Mfg. Co.
Wacline, Inc.

Servo

Analogue Controls, Inc.
CDC Control Services, Inc.
Consolidated Airborne Systems, Inc.
Datran Electronics, Div.-Mid-Continent Mfg., Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronic Associates, Inc.
Exact Engrg. & Mfg. Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gray Mfg. Co., The
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hagan Chemicals & Controls, Inc.
Kearfott Co., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Moran Instrument Corp.
North Atlantic Industries, Inc.
Reeves Instrument Corp.
Research Appliance Co.
Ryan Aeronautical Co.
Theta Instrument Corp.
Weston Hydraulics, Ltd.

Smoke & Combustion, Electronic

Electron-Radar Products
Electronics Corp. of America
Leeds & Northrup Co.

Sound Level

Georator Corp.
Herman Hosmer Scott, Inc.

Specific Gravity

Brooks Rotameter Co.
Fischer & Porter Co.
General Scientific Equipment Co.
Potter Aeronautical Corp.

Strain

B & F Instruments, Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Columbia Research Labs.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Datran Electronics, Div.-Mid-Continent Mfg., Inc.
Daytronic Corp.
General Electric Co., Apparatus Sales Div.
Gilmore Industries Inc.
Industrial Control Co.
Owen Labs., Inc.
Performance Measurements Co.
Task Corp.

Temperature

Arnoux Corp.
Assembly Products, Inc.
Atlantic Instrument Corp., Sub.—American Electronics, Inc.
Avien, Inc.
Barton Instrument Corp.
Beckman & Whitley, Inc.
Cambridge Instrument Company, Inc.
Cardinal Instrumentation Corp.
Consolidated Avionics Corp.
W. C. Dillon & Co., Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Epic, Inc.
Fenwal Inc.
Fischer & Porter Co.
Flow Corp.
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General Controls Co.
General Scientific Equipment Co.
Gilmore Industries Inc.
Hickok Electrical Instrument Co., The
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
Instruments Corp., The
International Radiant Corp.
***KAHN & CO., INC.**
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Leeds & Northrup Co.
Lewis Engrg. Co., The
Mercury International Industries Inc.
Minco Products, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
North Atlantic Industries, Inc.
Palmer Thermometers, Inc.
Performance Measurements Co.
Philadelphia Scientific Glass Co.
Powers Regulator Co., The
Pyrometer Instrument Co., Inc.
***ROCHESTER MFG. CO. INC.**
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Scientific Instrument Co.
Tempil Corp.
Thermo Electric Co., Inc.
Vap-Air Div., Vapor Heating Corp.
Victory Engineering Corp.
Weksler Instrument Corp.
Westronics Inc.

Thrust

B & F Instruments, Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Columbia Research Labs.
Daytronic Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gilmore Industries Inc.
Gorrell & Gorrell
Minneapolis-Honeywell Regulator Co., Indust. Div.
Performance Measurements Co.
Photocon Research Products
Reeves Instrument Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Timing

Advanced Products Co., The
Bergen Labs.
Computer-Measurements Corp.
Electro Products Labs., Inc.
Erie Resistor Corp.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
General Railway Signal Co.
Gilmore Industries Inc.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Lytle Engrg. & Mfg. Co.
Ernst Norrman Laboratories
Systron Corp.
G. C. Wilson & Co.

Torque

B & F Instruments, Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Bergen Labs.
Crescent Engrg. & Research Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Gilmore Industries Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Performance Measurements Co.
Task Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

True Air Speed

Fairchild Controls Corp., Components Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
***WALLACE O. LEONARD, INC.**
Research, Inc.
Servomechanisms, Inc.

Vacuum

Amthor Testing Instrument Co., Inc.
Consolidated Electrodynamics Corp.
Consolidated Electrodynamics Corp., Rochester Div.
Decker Corp., The
Dynamic Instrument Co., Inc.
Ellison Draft Gage Co.
General Electric Co., Apparatus Sales Div.
Green Rectifier Co.
High Vacuum Equipment Corp.
Gerard G. Leeds Co., Inc.
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NRC Equipment Corp.
Northam Electronics, Inc.
Process & Instruments
***ROCHESTER MFG. CO. INC.**
Trimount Instrument Co.
U. S. Gauge Div.-American Machine & Metals, Inc.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.

Volume

Hickok Electrical Instrument Co., The
Simmonds Aerocessories, Inc.

Vibration

Atlantic Research Corp.
Cambridge Instrument Company, Inc.
Columbia Research Labs.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Electro Products Labs., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Endevco Corp.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gilmore Industries Inc.
***KAHN & CO., INC.**
Kay Electric Co.
MB Mfg. Co.
Massa Labs., Inc.
Herman Hosmer Scott, Inc.
Tel-Instrument Electronics Corp.
Videon Electronic Corp.

INDUCTANCE SPECIALTIES, MEASUREMENT

Barnes Development Co.
Crescent Engrg. & Research Co.
Leeds & Northrup Co.
United Transformer Corp.

INDUCTANCES, VARIABLE

Burnell & Co., Inc.
CGS Labs., Inc.
Crescent Engrg. & Research Co.
General Railway Signal Co.
Georator Corp.
E. F. Johnson Co.
Leeds & Northrup Co.
Magnetico, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Telectro Industries Corp.
United Transformer Corp.
Vari-L Co., Inc.
Warren Transformer Co., Inc.

INDUCTORS

Aladdin Electronics, Div.-Aladdin Industries Inc.
American Research & Mfg. Corp.
Burnell & Co., Inc.
CGS Labs., Inc.
D & R, Ltd.
General Railway Signal Co.
Georator Corp.
E. F. Johnson Co.
Lenkurt Electric Co., Inc.
Magnetico, Inc.
J. W. Miller Co.
NYT Electronics, Inc.
North Hills Electric Co., Inc.
Precision, Inc.
Telectro Industries Corp.
Transformers, Inc.
Tresco, Inc.
Tri-Dex Co.
United Transformer Corp.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**

INDUCTORS, COILS

Advance Industries, Inc.
Aerolite Electronics Corp.
American Research & Mfg. Corp.
Boonton Radio Corp.
Burnell & Co., Inc.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
E. F. Johnson Co.
Lenkurt Electric Co., Inc.
Magnetico, Inc.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Precision, Inc.
Redman Electronics Corp.
Telectro Industries Corp.
Tri-Dex Co.
United Transformer Corp.
Warren Transformer Co., Inc.
Western Coil Products Co.
***WESTINGHOUSE ELECTRIC CORP.**

INFRARED DETECTION SYSTEMS

American Optical Co., Instrument Div.
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Barnes Engineering Co.
Coleman Engrg. Co., Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Davidson Mfg. Co.
Eastman Kodak Co.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
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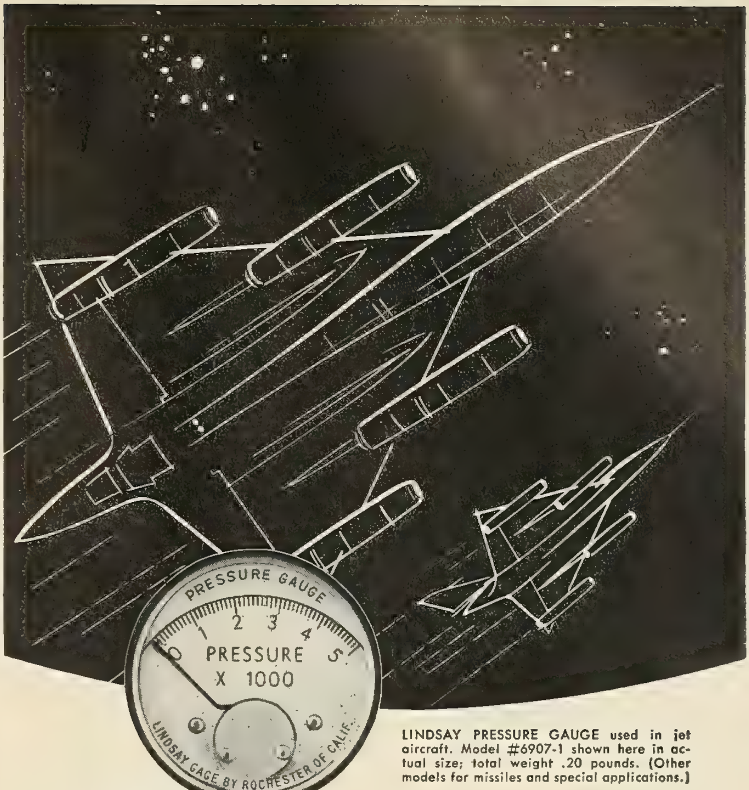
Infrared Industries Inc.
Librascope Inc.
Metavac, Inc.
Mine Safety Appliances Co.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Optomechanisms Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Perkin-Elmer Corp.
Philco Corp., Government & Industrial Divs.
Q. O. S. Corp.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Servo Corp. of America
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Wollensak Optical Co.



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Librascope Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Q. O. S. Corp.
Skiatron Electronics & Television Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

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*BAUSCH & LOMB OPTICAL CO.
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Eastman Kodak Co.
Electronics Corp. of America
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Haller Raymond & Brown Inc.
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Librascope Inc.
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Metavac, Inc.
Optomechanisms Inc.
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Philco Corp., Government & Industrial Divs.
Q. O. S. Corp.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

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Alto Scientific Co., Inc.
Assembly Products, Inc.
Associated Research, Inc.
Barnes Development Co.
Barton Instrument Corp.
Boonton Radio Corp.
Consolidated Electrodynamics Corp.
Daven Co., The
Davenport Mfg. Co.
Dynac, Inc.
Dynamic Instrument Co., Inc.
Electric Auto-Lite Co., The
Fenwal Inc.
John Fluke Mfg. Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Communication Co.
Hallamore Electronics Co.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
*KAHN & CO., INC.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Librascope Inc.
Marion Electrical Instrument Co.
North Atlantic Industries, Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Ammeters

Alto Scientific Co., Inc.
Assembly Products, Inc.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
General Electric Co., Apparatus Sales Div.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
*ROCHESTER MFG. CO. INC.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Audiometers

Daven Co., The
Hammett Electric Co.
*INTERELECTRONICS CORP.
Phaostron Instrument & Electronic Co.
Sun Electric Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Bridges

Airborne Instruments Lab., Inc.
Allegheny Instrument Co., Inc.
Alpha Instrument Co.
B & F Instruments, Inc.
Barnes Development Co.
Boonton Electronics Corp.
Boonton Radio Corp.
Briggs Associates, Inc.
Cal-Ohm Labs., Inc.
Cambridge Instrument Company, Inc.
Crescent Engrg. & Research Co.
Electro-Measurements Inc.
Electro-Tech Equipment Co.
Elm Mfg. Co. Inc.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gertsch Products Inc.
Gray Instrument Co.
Hammett Electric Co.
*KAHN & CO., INC.
Leeds & Northrup Co.
Marconi Instruments
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Narda Microwave Corp., The
Network Mfg. Corp.
Optimized Devices, Inc.
Radex Corp.
Simmonds Aerocessories, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Calibrators

Allegany Instrument Co., Inc.
Davenport Mfg. Co.
Dynamic Instrument Co., Inc.
Electro Instruments, Inc.
Electro Instruments, Inc.
John Fluke Mfg. Co., Inc.
Georator Corp.
Gertsch Products Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
Gerard G. Leeds Co., Inc.
Moran Instrument Corp.
North Atlantic Industries, Inc.
Optimized Devices, Inc.
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Comparators

Barnes Development Co.
Cleveland Instrument Co.
Consolidated Avionics Corp.
Dynac, Inc.
Electro Instruments, Inc.
General Communication Co.
Georator Corp.
Hammett Electric Co.
Jones & Lamson Machine Co.
Optimized Devices, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Varo Mfg. Co.

Galvanometers

Assembly Products, Inc.
James G. Biddle Co.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Terminal Radio Corp.

Magnetometers

Associated Research, Inc.
Hammett Electric Co.
Terminal Radio Corp.

Megohmmeters

Barnes Development Co.
James G. Biddle Co.
Consolidated Airborne Systems, Inc.
Curtiss-Wright Corp., Electronics Div.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Georator Corp.
Hammett Electric Co.
Industrial Instruments Inc.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Microammeters

Assembly Products, Inc.
Barnes Development Co.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Gulton Industries, Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Coil Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Microfaradmeters

Ballantine Labs., Inc.
Barnes Development Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Micro-Microammeters

Barnes Development Co.
Curtiss-Wright Corp., Electronics Div.
Epic, Inc.
Hammett Electric Co.
Ideal Precision Meter Co., Inc.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Phaostron Instrument & Electric Co.
Q. V. S. Inc.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Milliammeters

Alto Scientific Co., Inc.
Assembly Products, Inc.
Barnes Development Co.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apapratus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div
National Coil Co.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Millivoltmeters

Allegany Instrument Co., Inc.
Alpha Instrument Co.
Alto Scientific Co., Inc.
Assembly Products, Inc.
Ballantine Labs., Inc.
Boonton Electronics Corp.
Curtiss-Wright Corp., Electronics Div.
Daven Co., The
Davenport Mfg. Co.
Dunlap Electronics, Inc.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Fisher Research Lab., Inc.
Flow Corp.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div
Gulton Industries, Inc.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
*KAHN & CO., INC.
Gerard G. Leeds Co., Inc.

Minneapolis-Honeywell Regulator Co., Indust. Div.
Marion Electrical Instrument Co.
Meters Inc.
National Coil Co.
Non-Linear Systems Inc.
North Atlantic Industries, Inc.
Owen Labs., Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Thermo Electric Co., Inc.
Wacline, Inc.

Ohmmeters

Associated Research, Inc.
Bergen Labs.
James G. Biddle Co.
Davenport Mfg. Co.
J. W. Dice Co.
Electric Auto-Lite Co., The
Electro Instruments, Inc.
Electronic Associates, Inc.
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Epic, Inc.
Gray Instrument Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Instruments Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Meters Inc.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Panel

Assembly Products, Inc.
Atlantic Engravers, Inc.
Canadian Radium & Uranium Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Gerard G. Leeds Co., Inc.
Marco Industries Co.
Marion Electrical Instrument Co.
Meters Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Star Engraving Co., Ltd.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Ratiometers

Allegany Instrument Co., Inc.
Brunswick Instruments
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro Instruments, Inc.
Gertsch Products Inc.
Hammett Electric Co.
Hickok Electrical Insrtument Co., The
Gerard G. Leeds Co., Inc.
Non-Linear Systems Inc.
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Recorders

Allegany Instrument Co., Inc.
Antlab Inc.
Barton Instrument Corp.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Consolidated Electrodynamics Corp.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Edgerton, Germeshausen & Grier, Inc.
Electric Auto-Lite Co., The
Fischer & Porter Co.
General Electric Co., Apparatus Sales Div.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Instruments Corp., The
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Offner Electronics Inc.
Research Appliance Co.
Soroban Engrg., Inc.

Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Standards

Barnes Development Co.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gertsch Products Inc.
Gray Instrument Co.
Hammett Electric Co.
Holt Instrument Laboratories, Div.-Holt Hardwood Co., Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Tracers, Signal

Hammett Electric Co.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.

Ultrasonic

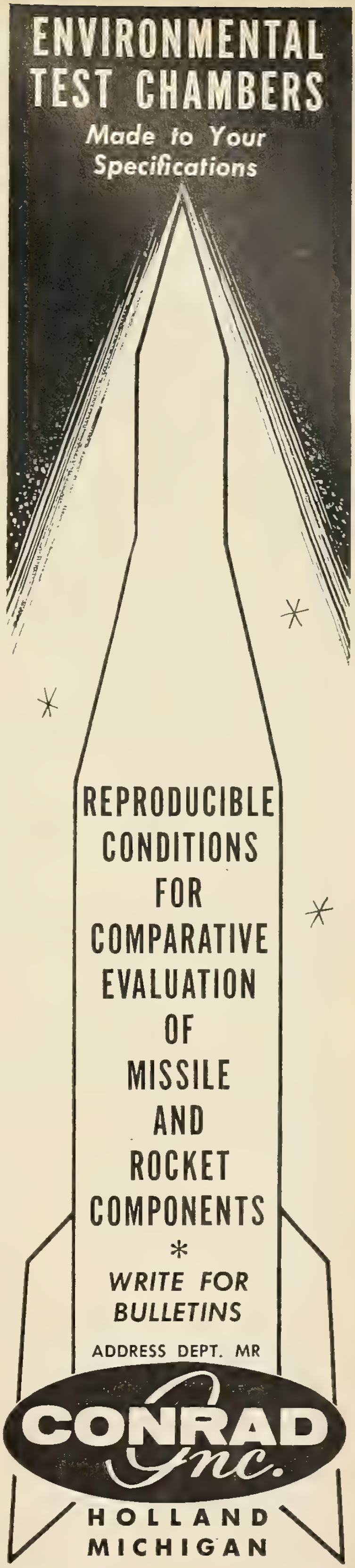
Acoustica Associates, Inc.
Alcar Instruments, Inc.
Arenberg Ultrasonic Laboratory, Inc.
Branson Instruments, Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
J. W. Dice Co.
Georator Corp.
Gulton Industries, Inc.
Hammett Electric Co.
Massa Labs., Inc.
Narda Ultrasonics Corp., The
Photocon Research Products
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Western Electro-Acoustic Lab.

Voltmeters

Alpha Instrument Co.
Alto Scientific Co., Inc.
American Metrix Corp.
Assembly Products, Inc.
Ballantine Labs., Inc.
Bergen Labs.
Boonton Electronics Corp.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Dunlap Electronics, Inc.
Electric Design & Mfg. Co.
Electro Instruments, Inc.
Electronic Associates, Inc.
Electro-Tech Equipment Co.
Epic, Inc.
Epsco Inc.
Flow Corp.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gulton Industries, Inc.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
National Coil Co.
Non-Linear Systems Inc.
North Atlantic Industries, Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Seco Mfg. Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Systron Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Volt-Ohm-Milliammeters

Alpha Instrument Co.
Electronic Measurements Corp.
Electro-Tech Equipment Co.
Epic, Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Instrument Laboratories
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Meters Inc.
National Coil Co.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.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REPRODUCIBLE CONDITIONS FOR COMPARATIVE EVALUATION OF MISSILE AND ROCKET COMPONENTS
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CONRAD Inc.
HOLLAND MICHIGAN

Wattmeters

Bergen Labs.
Cambridge Instrument Company, Inc
Electro Impulse Lab., Inc
Electro-Tech Equipment Co.
Epic, Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Microwave Electronics Div., Sperry Gyroscope Co.
National Coil Co.
Phaostron Instrument & Electronic Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

INSTRUMENTS, GRAPHIC RECORDING

Airborne Instruments Lab., Inc.
Alden Systems Co.
Allegany Instrument Co., Inc.
Antlab Inc.
Baird-Atomic, Inc.
Barnes Development Co.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Curtiss-Wright Corp., Electronics Div.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Devco Engrg. Inc.
Edgerton, Germeshausen & Grier Inc.
Electro Instruments, Inc.
Electro-Medical Lab., Inc.
Electro-Tech Equipment Co.
Fenske Fedrick & Miller Co.
Fischer & Porter Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Gilmore Industries Inc.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Hogan Laboratories, Inc.
Impact-O-Graph Corp., The
Instruments Corp., The
Leeds & Northrup Co.
Librascope Inc.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
J. A. Maurer, Inc.
F. L. Moseley Co.
George L. Nankervis Co.
Palmer Thermometers, Inc.
Sanborn Co.
Scientific Instrument Co.
Southwestern Industrial Electronics Co.
Tally Register Corp.
Terminal Radio Corp.
Weksler Instrument Corp.
*WESTINGHOUSE ELECTRIC CORP.
Westronics Inc.

INSULATING COMPOUNDS

Biwax Corp.
Borden Chemical Co., The, Div.-The Borden Co., Resinite Dept.
Diamonite Products Mfg. Co.
Eagle-Picher Co., The
Hi-Test Chemical Corp.
*IDEAL CHEMICAL PRODUCTS, INC.
Merix Chemical Co.
Sauereisen Cements Co.
Silicones Div.-Union Carbide Corp.
Zophar Mills Inc.

LENSES, PRISMS, MIRRORS

*BAUSCH & LOMB OPTICAL CO.

LIGHTS

Alden Products Co.
Alden Systems Co.
Chicago Miniature Lamp Works
Circon Component Corp.
Day-Ray Products, Inc.
Edgerton, Germeshausen & Grier, Inc.
Grimes Mfg. Co.
Hammett Electric Co.
Kemlite Laboratories, Inc.
Marco Industries Co.
Master Specialties Co.

LINES, SLOTTED

BJ Electronics, Borg-Warner Corp.
California Technical Industries, Div.-Textron Inc.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Georator Corp.
Industrial Engravers Inc.
Omega Labs., Inc.
Radar Design Corp.
Sohl Co., The
Telectro Industries Corp.
Uniwave, Inc.
Wacline, Inc.

LOCATORS

*AMERICAN MACHINE & FOUNDRY CO.
Associated Research, Inc.
Dit-Mco, Inc., Electronics Div.
Tobe Deutschmann Corp.

Cable & Line Fault

Associated Research, Inc.
James G. Biddle Co.
Davenport Mfg. Co.
Dit-Mco, Inc., Electronics Div.
Lavoie Labs., Inc.
Peschel Electronics, Inc.
Tobe Deutschmann Corp.

Metal Flaw

Turco Products, Inc.

Non-Metal Flaw

Turco Products, Inc.

Open-Short

Dit-Mco, Inc., Electronics Div.
Peschel Electronics, Inc.

LUGS

AMP Inc.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Connector Corp.
Goe Engrg. Co.
Hallett Mfg. Co.
Hobson Brothers, Inc.
Kulka Electric Corp.
Litton Industries, Components Div.
Malco Tool & Mfg. Co.
Marquardt Aircraft Co.
Waldom Electronics Inc.

MACH LIMIT SWITCHES

Eclipse-Pioneer Div., Bendix Aviation Corp.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Sealectric Switch & Relay Corp.
Specialties, Inc.
Winder Aircraft Corp. of Fla.

MACHINES, VIBRATION FATIGUE TESTING

*AMERICAN MACHINE & FOUNDRY CO.
Anchor Specialty Mfg. Co. Inc.
G. W. Galloway Co.
Royal Industries, Inc.
Winder Aircraft Corp. of Fla.

MACHINES, WEIGHING

*AMERICAN MACHINE & FOUNDRY CO.
Dynametrics Corp.

MACHMETERS

Dynametrics Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
M. Ten Bosch, Inc.

MAGNETIC ANALYSIS EQUIPMENT

Advance Industries, Inc.
J. W. Dice Co.
General Electric Co., Apparatus Sales Div.
Rese Engrg., Inc.

MAGNETOMETERS

Hammett Electric Co.
Ryan Aeronautical Co.

MANOMETERS

Consolidated Electrodynamics Corp.
Friez Instrument Div.-Bendix Aviation Corp.
E. Vernon Hill & Co.
Ideal-Aerosmith, Inc.
Strata Instrument Co.
Trimount Instrument Co.

MEGOHMMETERS, VACUUM TUBE

Associated Research, Inc.
Curtiss-Wright Corp., Electronics Div.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Georator Corp.
Industrial Instruments Inc.
*RHEEM MFG. CO., ELECTRONICS DIV.
Slaughter Co., Inc.
Terminal Radio Corp.

METEORLOGICAL EQUIPMENT, ELECTRONIC

Benson-Lehner Corp.
*COOPER DEVELOPMENT CORP.
Friez Instrument Div.-Bendix Aviation Corp.
Haller Raymond & Brown Inc.
Instruments Corp., The
J. A. Maurer, Inc.
Republic Aviation Corp., Guided Missiles Div.
Resdel Engrg. Corp.
Telectro Industries Corp.

METEORLOGICAL INSTRUMENTS

*AMERICAN MACHINE & FOUNDRY CO.
*COOPER DEVELOPMENT CORP.
Epic, Inc.
Friez Instrument Div.-Bendix Aviation Corp.
Instruments Corp., The
J. A. Maurer, Inc.
Telectro Industries Corp.
Virginia Plak Co.

METERS

Advanced Products Co., The
Alto Scientific Co., Inc.
Amerac Inc.
Associated Research, Inc.
BJ Electronics, Borg-Warner Corp.
Barnes Development Co.
Barton Instrument Corp.
Boonton Radio Corp.
Burr-Brown Research Corp.
Burroughs Corp.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Daven Co., The
Davenport Mfg. Co.
Dynac, Inc.
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div.-Engin National Watch Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Geartronics Corp.
General Communication Co.
Hammett Electric Co.
*A. W. HAYDON CO., THE
Haydon Div.-General Time Corp.
Hickok Electrical Instrument Co., The
*KAHN & CO., INC.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Maico Electronics, Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Scientific Instrument Co.
Sun Electric Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wacline, Inc.

Acceleration

Cambridge Instrument Company, Inc.
Columbia Research Labs.
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Epic, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hammett Electric Co.
Impact-O-Graph Corp., The
Miljan Div., Paul Omohundro Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Pioneer-Central Div., Bendix Aviation Corp.
Reeves Instrument Corp.
Servomechanisms, Inc.
Sun Electric Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Ultradyne, Inc.

Ammeter

American Metrix Corp.
Assembly Products, Inc.
Beede Electrical Instrument Co. Inc.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.

Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
***ROCHESTER MFG. CO. INC.**
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Ammeter R-F

Alto Scientific Co., Inc.
Assembly Products, Inc.
Beede Electrical Instrument Co. Inc.
Electro-Tech Equipment Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Phaostron Instrument & Electronic Co.
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Attenuation

Demornay-Bonardi
Hammett Electric Co.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Audio

Amelco, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Phaostron Instrument & Electronic Co.
Ryan Aeronautical Co.
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Cable Testing

Associated Research, Inc.
Barnes Development Co.
James G. Biddle Co.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Hammett Electric Co.
Instrument Laboratories
Gerard G. Leeds Co., Inc.
Peschel Electronics, Inc.
Radar Engineers
Slaughter Co., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Capacitance

Barnes Development Co.
James G. Biddle Co.
Boonton Electronics Corp.
Epic, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Precision Apparatus Co., Inc.
Terminal Radio Corp.

Conductance

Boonton Electronics Corp.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Counting Rate

Baird-Atomic, Inc.
Dynac, Inc.
Erie Resistor Corp.
Hammett Electric Co.
Hupp Instrumation, Div.—Erie-Pacific
I-L-S Instrument Corp.
Gerard G. Leeds Co., Inc.
Northeastern Engrg. Inc.
Potter Aeronautical Corp.
Radiation Counter Labs., Inc.
Systron Corp.
Terminal Radio Corp.
Walkirt Co.

Counting Rate, Nuclear

BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

D Arsonval

Assembly Products, Inc.
Beede Electrical Instrument Co. Inc.
Cambridge Instrument Company, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Leeds & Northrup Co.
Meters Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Decibel

Beede Electrical Instrument Co. Inc.
Boonton Electronics Corp.
Chesapeake Instrument Corp.
Dunlap Electronics, Inc.
Electro-Tech Equipment Co.
Georator Corp.
Hammett Electric Co.
Ideal Precision Meter Co., Inc.
Gerard G. Leeds Co., Inc.
Meters Inc.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Herman Hosmer Scott, Inc.
Simpson Electric Co.
Sun Electric Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wacline, Inc.
Western Electro-Acoustic Lab.

Deflection

Cleveland Instrument Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Deviation

Barnes Development Co.
Georator Corp.
Gertsch Products Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Lampkin Labs., Inc.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Reeves Instrument Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Distortion and Noise

Boonton Electronics Corp.
Empire Products Sales Corp.
Georator Corp.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Ryan Aeronautical Co.
Herman Hosmer Scott, Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Western Electro-Acoustic Lab.

Dosimeter

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Cambridge Instrument Company, Inc.
Hammett Electric Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Dosimeter, Nuclear

***AMERICAN MACHINE & FOUNDRY CO.**
***ANTON ELECTRONIC LABS., INC.**
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Cambridge Instrument Company, Inc.
Hammett Electric Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Elapsed Time

Advanced Products Co., The
***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Bergen Labs.
Computer-Measurements Corp.
Dynac, Inc.
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Epic, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hammett Electric Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Hupp Instrumation, Div.—Erie-Pacific
I-L-S Instrument Corp.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Simpson Electric Co.
Sun Electric Corp.
Systron Corp.
Terminal Radio Corp.
Wacline, Inc.
Walkirt Co.
***WESTINGHOUSE ELECTRIC CORP.**

Electrometer

Cambridge Instrument Company, Inc.
Curtiss-Wright Corp., Electronics Div.
Hammett Electric Co.
Keithley Instruments, Inc.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Nuclear-Chicago Corp.
Terminal Radio Corp.
Wacline, Inc.

Electronic Micrometer

Cleveland Instrument Co.
Daytronic Corp.
Decker Corp., The
J. W. Dice Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Events-Per-Unit-Time

Advanced Products Co., The
Baird-Atomic, Inc.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Computer-Measurements Corp.
Dunlap Electronics, Inc.
Dynac, Inc.
Electronic Associates, Inc.
Erie Resistor Corp.
Hammett Electric Co.
Hupp Instrumation, Div.—Erie-Pacific
I-L-S Instrument Corp.
Gerard G. Leeds Co., Inc.
Potter Aeronautical Corp.
Radiation Counter Labs., Inc.
Southwestern Industrial Electronics Co.
Systron Corp.
Terminal Radio Corp.
Walkirt Co.

Exposure for Film

General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Lektra Laboratories, Inc.
Terminal Radio Corp.

Field Strength

Barton Instrument Corp.
Blonder-Tongue Labs., Inc.
Empire Products Sales Corp.
Hammett Electric Co.
Nems Clarke Co., Div.-Vitro Corp. of America
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Simpson Electric Co.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.

Flow

Baird-Atomic, Inc.
Barton Instrument Corp.
Brooks Rotameter Co.
Computer-Measurements Corp.
Dynac, Inc.
Fischer & Porter Co.
Flow Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
George L. Nankervis Co.
Nuclear Corp. of America, Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Trimount Instrument Co.
Waugh Engrg. Co.

Flutter

Amplifier Corp. of America
D & R, Ltd.
Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Telectro Industries Corp.
Terminal Radio Corp.

Flux

Beede Electrical Instrument Co. Inc.
Cambridge Instrument Company, Inc.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

FM Deviation

Browning Laboratories, Inc.
***DATA-CONTROL SYSTEMS INC.**
Fenske Fedrick & Miller Co.
Georator Corp.
Gertsch Products Inc.
Hammett Electric Co.
Lampkin Labs., Inc.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Frequency

Acromag Inc.
Aircom Inc.
Amerac Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Beede Electrical Instrument Co. Inc.
Computer-Measurements Corp.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Dunlap Electronics, Inc.
Dynac, Inc.
Electro Impulse Lab., Inc.
Epic, Inc.
Erie Resistor Corp.
General Communication Co.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Gertsch Products Inc.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Hupp Instrumation, Div.—Erie-Pacific
Kay Electric Co.
Lampkin Labs., Inc.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Narda Microwave Corp., The
Potter Aeronautical Corp.
Production Research Corp.
Systron Corp.
***TELERAD MFG. CORP.**
Teletronics Laboratory Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Waugh Engrg. Co.
***WESTINGHOUSE ELECTRIC CORP.**

Galvanometer

Assembly Products, Inc.
Beede Electrical Instruments Co. Inc.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Kin Tel Div.-Cohu Electronics, Inc.
Leeds & Northrup Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Goniometer

Eclipse-Pioneer Div., Bendix Aviation Corp.
Electro-Mec Lab. Inc.
Hammett Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.

Grid Dip

Alto Scientific Co., Inc.
Boonton Electronics Corp.
Hammett Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.

Impedance

Acton Laboratories Inc.
Alpha Instrument Co.
BJ Electronics, Borg-Warner Corp.
Barnes Development Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

Infrared

Baird-Atomic, Inc.
Hammett Electric Co.
Infrared Industries Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Production Research Corp.
Terminal Radio Corp.

Intermodulation

Audio Instrument Co. Inc.
Empire Products Sales Corp.
John Fluke Mfg. Co., Inc.
Hammett Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Kilovolt

Associated Research, Inc.
Beede Electrical Instrument Co. Inc.
Davenport Mfg. Co.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Ferranti Electric Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Gertsch Products Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Jennings Radio Mfg. Corp.
Keithley Instruments, Inc.
Marion Electrical Instrument Co.
Meters Inc.
Opad Electric Co.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Ryan Aeronautical Co.
Sun Electric Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Kilowatt

Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Light

Electro-Tech Equipment Co.
Georator Corp.
Hammett Electric Co.
Tensor Electric Development Co., Inc
Terminal Radio Corp.

Megohm

Associated Research, Inc.
James G. Biddle Co.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Georator Corp.
Hammett Electric Co.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Q. V. S. Inc.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Microfarad

Consolidated Airborne Systems, Inc.
Epic, Inc.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Microvolt

Boonton Electronics Corp.
Empire Products Sales Corp.
Epic, Inc.
Flow Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Wacline, Inc.

Microwave

Airtron, Inc.
California Technical Industries, Div.-Textron Inc.
Chemalloy Electronics Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Electro Impulse Lab., Inc.
General Communication Co.
Hammett Electric Co.
Keithley Instruments, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Sanders Associates, Inc.
***TELERAD MFG. CORP.**
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wacline, Inc.
Waveline, Inc.

Milliampere

American Metrix Corp.
Assembly Products, Inc.
Beede Electrical Instrument Co., Inc.
Cambridge Instrument Company, Inc.
Davenport Mfg. Co.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Coil Co.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Millivolt

American Metrix Corp.
Assembly Products, Inc.
Beede Electrical Instrument Co. Inc.
Boonton Electronics Corp.
Burr-Brown Research Corp.
Curtiss-Wright Corp., Electronics Div.
Dunlap Electronics, Inc.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Fisher Research Lab., Inc.
Flow Corp.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
***KAHN & CO., INC.**
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
National Coil Co.
Non-Linear Systems Inc.
Owen Labs., Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Systron Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Thermo Electric Co., Inc.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Modulation

Beede Electrical Instrument Co. Inc.
Empire Products Sales Corp.
Georator Corp.
Hammett Electric Co.
Lampkin Labs., Inc.

Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Varo Mfg. Co.

Moisture, Electronic

Consolidated Electrodynamics Corp.
Hammett Electric Co.
Marconi Instruments
Moisture Register Co.
Terminal Radio Corp.

Multimeter

Alpha Instrument Co.
American Metrix Corp.
***ANTON ELECTRONIC LABS., INC.**
Bergen Labs.
Daven Co., The
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Multiplier

Daven Co., The
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Phaostron Instrument & Electronic Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Ohm

Alpha Instrument Co.
American Metrix Corp.
Associated Research, Inc.
Barnes Development Co.
James G. Biddle Co.
Davenport Mfg. Co.
J. W. Dice Co.
Electric Auto-Lite Co., The
Electronic Associates, Inc.
Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Meters Inc.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Precision Apparatus Co., Inc.
Simpson Electric Co.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Output, R-F

Boonton Electronics Corp.
Flow Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Q. V. S. Inc.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Wacline, Inc.

Panel

Assembly Products, Inc.
Atlantic Engravers, Inc.
Beede Electrical Instrument Co. Inc.
Canadian Radium & Uranium Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Ideal Precision Meter Co., Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Phaostron Instrument & Electronic Co.
Precise Development Corp.
Precision Apparatus Co., Inc.
Q. V. S. Inc.
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Ph Meters, Recorders & Comparators

Cambridge Instrument Company, Inc.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photovolt Corp.
Terminal Radio Corp.

Phase

Acton Laboratories Inc.
Bergen Labs.
Computer-Measurements Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
North Atlantic Industries, Inc.
Ryan Aeronautical Co.
Terminal Radio Corp.
Theta Instrument Corp.
Trio Laboratories, Inc.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Weston Hydraulics, Ltd.
Wintronics

Photoelectric Reflection

Eldorado Electronics
Hammett Electric Co.
Optomechanisms Inc.
Photovolt Corp.
Terminal Radio Corp.

Power Output

General Electric Co., Apparatus Sales Div.
Georator Corp.
Hammett Electric Co.
Instrument Laboratories
Gerard G. Leeds Co., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Pressure

Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Decker Corp., The
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Northam Electronics, Inc.
Scientific Instrument Co.
Terminal Radio Corp.
Trimount Instrument Co.
Weksler Instrument Corp.

Pyrometer

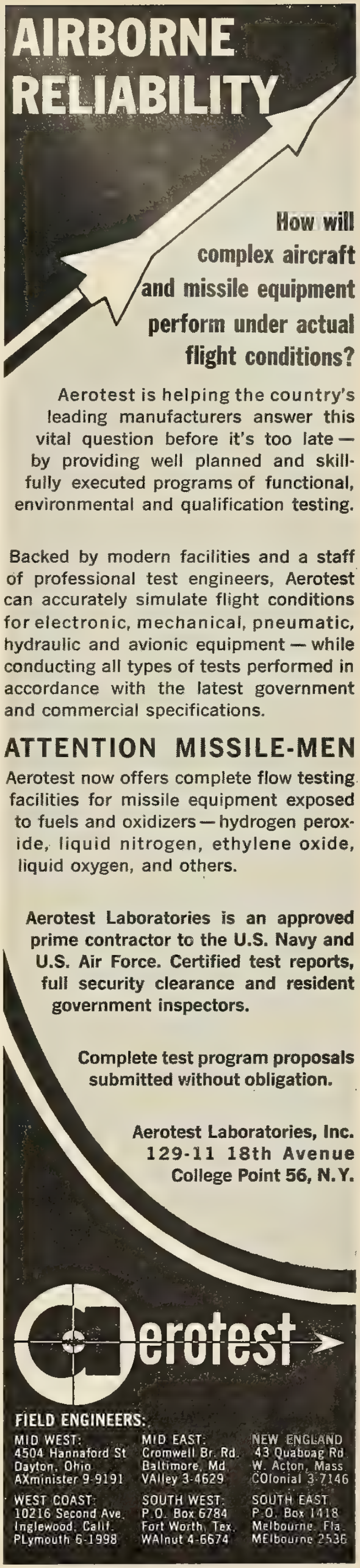
Barnes Engineering Co.
Cambridge Instrument Company, Inc.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Illinois Testing Laboratories, Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Phaostron Instrument & Electronic Co.
Pyrometer Instrument Co., Inc.
Terminal Radio Corp.
Thermo Electric Co., Inc.

Q

Alpha Instrument Co.
Boonton Radio Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Marconi Instruments
Terminal Radio Corp.

Radiation, Nuclear

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Curtiss-Wright Corp., Electronics Div.
Hammett Electric Co.
Jordan Electronics, Div.-Victoreen Instrument Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
St. John X-Ray Laboratory
Telectro Industries Corp.
Terminal Radio Corp.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COlonial 3-7146

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Inglewood, Calif.
PLymouth 6-1998

SOUTH WEST:
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Fort Worth, Tex.
WAlnut 4-6674

SOUTH EAST
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Melbourne, Fla.
MElbourne 2536

Rate

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Baird-Atomic, Inc.
Dynac, Inc.
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Miljan Div., Paul Omohundro Co.
Nuclear-Chicago Corp.
Reeves Instrument Corp.
Terminal Radio Corp.

Ratio

Baird-Atomic, Inc.
Dynac, Inc.
Fischer & Porter Co.
Gertsch Products Inc.
Guardian Electric Mfg. Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Non-Linear Systems Inc.
Potter Aeronautical Corp.
Terminal Radio Corp.
Transformers, Inc.

Recording

Acton Laboratories Inc.
Antlab Inc.
Baird-Atomic, Inc.
Consolidated Electrodynamics Corp.
Electro-Tech Equipment Co.
Hammett Electric Co.
General Electric Co., Apparatus Sales Div.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Potter Aeronautical Corp.
Research Appliance Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

R-F Power

Aircom Inc.
BJ Electronics, Borg-Warner Corp.
Flow Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Gerard G. Leeds Co., Inc.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Northeast Electronics Corp.
Terminal Radio Corp.
Wacline, Inc.

Snap Around

Electro-Tech Equipment Co.
Hammett Electric Co.
Terminal Radio Corp.

Sound Level

Air Logistics Corp.
Beede Electrical Instrument Co. Inc.
Chesapeake Instrument Corp.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Erwood Inc.
Georator Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Kay Electric Co.
Herman Hosmer Scott, Inc.
Simpson Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.
Western Electro-Acoustic Lab.

Spectral

Baird-Atomic, Inc.
Hammett Electric Co.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Standing Wave Radio

Aircom Inc.
Alpha Instrument Co.
Alto Scientific Co., Inc.
BJ Electronics, Borg-Warner Corp.
Browning Laboratories, Inc.
California Technical Industries, Div.-Textron Inc.
Demornay-Bonardi
Electro Impulse Lab., Inc.
Hammett Electric Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Northeast Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.

Tachometer

Acromag Inc.
Associated Research, Inc.
James G. Biddle Co.
Cardinal Instrumentation Corp.
Consolidated Airborne Systems, Inc.
Dynac, Inc.
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
Epic, Inc.
Geartronics Corp.
Hammett Electric Co.
I-L-S Instrument Corp.
Instruments Corp., The
Malco Electronics, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Potter Aeronautical Corp.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
Waugh Engrg. Co.
***WESTINGHOUSE ELECTRIC CORP.**

Tension

Dynamic Instrument Co., Inc.
Hammett Electric Co.
Terminal Radio Corp.

Thermocouple

Acromag Inc.
Assembly Products, Inc.
Electro-Tech Equipment Co.
Epic, Inc.
Fenwal Inc.
Flow Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Illinois Testing Laboratories, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Pyrometer Instrument Co., Inc.
Royco Instruments
Simpson Electric Co.
Sun Electric Corp.
Terminal Radio Corp.
Thermo Electric Co., Inc.
Wacline, Inc.

Thermometer

Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
Hammett Electric Co.
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
Lewis Engrg. Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Palmer Thermometers, Inc.
Philadelphia Scientific Glass Co.
Powers Regulator Co., The
***ROCHESTER MFG. CO. INC.**
Roflan Co., The
Scientific Instrument Co.
Simpson Electric Co.
Terminal Radio Corp.
Weksler Instrument Corp.

Thrust

B & F Instruments, Inc.
Columbia Research Labs.
Consolidated Controls Corp.
Daytronic Corp.
Dynametrics Corp.
Gilmore Industries Inc.
Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photocon Research Products
Terminal Radio Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Time

Advanced Products Co., The
Bergen Labs
M. Ducommun Co.
Electro-Tech Equipment Co.
Erie Resistor Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Lytle Engrg. & Mfg. Co.
Terminal Radio Corp.
Wacline, Inc.
G. C. Wilson & Co.

Torque

Arch Gear Works Inc.
B & F Instruments, Inc.
Bergen Labs.
Consolidated Controls Corp.
Dynametrics Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Terminal Radio Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Ultra-Violet

Baird-Atomic, Inc.
Hammett Electric Co.
Terminal Radio Corp.
Ultra-Violet Products, Inc.

Vacuum Tube Volt

Acton Laboratories Inc.
Alpha Instrument Co.
Alto Scientific Co., Inc.
American Metrix Corp.
Boonton Electronics Corp.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Flow Corp.
Georator Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Instrument Electronics Corp.
North Atlantic Industries, Inc.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leitch Engrg. Corp.
Minneapolis-Honeywell Regulator Co., Boston Div.
Precision Apparatus Co., Inc.
Southwestern Industrial Electronics Co.
Teletronics Laboratory Inc.
Terminal Radio Corp.
Trio Laboratories, Inc.

Vibrating Reed

James G. Biddle Co.
Electro-Tech Equipment Co.
Hammett Electric Co.
Nuclear-Chicago Corp.
Terminal Radio Corp.

Vibration

Calidyne Co., Inc., The
Cambridge Instrument Company, Inc.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Epic, Inc.
Erwood Inc.
Georator Corp.
Hammett Electric Co.
***KAHN & CO., INC.**
Kay Electric Co.
MB Mfg. Co.
Royal Industries, Inc.
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Viscosity, Electronic

Ferranti Electric Inc.
Hickok Electrical Instrument Co., The
Scientific Instrument Co.
Terminal Radio Corp.

Volt-Ohm, Electronic

Airborne Instruments Lab., Inc.
Alpha Instrument Co.
Bendix Aviation Corp., York Div.
Bergen Labs.
Canoga Corp. of California
Chemalloy Electronics Corp.
Electronic Associates, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Electro-Tech Equipment Co.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Empire Products Sales Corp.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Non-Linear Systems Inc.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Radar Design Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.

Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Trio Laboratories, Inc.
Uniwave, Inc.
Vectron, Inc.
Waveline, Inc.

Watt

Cubic Corp.
Davidson Mfg. Co.
Electro Impulse Lab., Inc.
Electro-Tech Equipment Co.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hayward Scientific Glass Corp.
Hickok Electrical Instrument Co., The
Microwave Electronics Div., Sperry Gyroscope Co.
Perkin-Elmer Corp.
Reeves Instrument Corp.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.
Zenith Optical Laboratory

Watt-Hour

Bergen Labs.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Sangamo Electric Co.
Southwest Products, Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Wave

Amerac Inc.
General Communication Co.
Hammett Electric Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Radar Design Corp.
Ryan Aeronautical Co.
Telectro Industries Corp.
Terminal Radio Corp.
Wacline, Inc.

Wow and Flutter

Amplifier Corp. of America
D & R, Ltd.
*DATA-CONTROL SYSTEMS INC.
Electric Eye Equipment Co.
Hammett Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Telectro Industries Corp.
Terminal Radio Corp.

X-Ray Intensity

*ANTON ELECTRONIC LABS., INC.
Electric Auto-Lite Co., The
Hammett Electric Co.
Instruments Div.-Philips Electronics, Inc.
Nuclear Corp. of America, Inc.
St. John X-Ray Laboratory
Tensor Electric Development Co., Inc.
Terminal Radio Corp.

MICA, GLASS BONDED

Allied Plastics Supply Corp.
William Brand & Co., Inc.
Demornay-Bonardi
Magentic Shield Div.-Perfection Mica Co.
Mycalex Corp. of America
Terminal Radio Corp.

MICROMETERS, ELECTRONIC

Alpha Instrument Co.
Cleveland Instrument Co.
Decker Corp., The
J. W. Dice Co.
Gerard G. Leeds Co., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Phaostron Instrument & Electronic Co.
Size Control Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

MICRO-OHMMETERS

Associated Research, Inc.
J. W. Dice Co.
Phaostron Instrument & Electronic Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

MICA PLATE AND SHEET

William Brand, & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Magnetic Shield Div.—Perfection Mica Co.
Terminal Radio Corp.

MICROMANOMETERS

Flow Corp.
Green Rectifier Co.
Hammett Electric Co.
E. Vernon Hill & Co.
Simpson Electric Co.
Terminal Radio Corp.
Trimount Instrument Co.

MICROSCOPES, ELECTRON

Instruments Div.-Philips Electronics, Inc.
Terminal Radio Corp.

MICROSCOPES, OPTICAL

*BAUSCH & LOMB OPTICAL CO.

MICROWAVE ACCESSORIES

Ainslie Corp.
Airborne Instruments Lab., Inc.
Airtron, Inc.
Baird-Atomic, Inc.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
Canoga Corp. of California
Continental Diamond Fibre Corp. Sub.—The Budd Co.
*COOPER DEVELOPMENT CORP.
Joe Davidson & Associates
Defiance Engrg. & Microwave Corp.
Demoray-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Driarie, Inc.
Electro Impulse Lab., Inc.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Engelhard Industries Inc., D. E. Makepeace Div.
General Communication Co.
John Gombos Co., Inc.
Goodyear Aircraft Corp.
J-V-M Microwave Co.
Kearfott Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Omega Labs., Inc.
Radar Design Corp.
Technical Appliance Corp.
Techniques, Inc.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Wacline, Inc.
Waveline, Inc.

MIDFAME SECTIONS, AXIAL FLOW

American Welding & Mfg. Co., The
Terminal Radio Corp.

MILLIOHMMETERS

Alpha Instrument Co.
Associated Research, Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Hammett Electric Co.
North Atlantic Industries, Inc.
Gerard G. Leeds Co., Inc.
Optimized Devices, Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

MOTORS, TIMING-REGULATED, CONSTANT SPEED

Advanced Products Co., The
American Electronics, Inc.
Bodine Electric Co.
Joe Davidson & Associates
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Exact Engrg. & Mfg. Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Railway Signal Co.
*A. W. HAYDON CO., THE
Haydon Div.-General Time Corp.
Instrument Motors
Lytle Engrg. & Mfg. Co.
National Pneumatic Co., Inc.
Stancil-Hoffman Corp., The
Terminal Radio Corp.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
Wacline, Inc.

MOTORS, SERVO

Airborne Accessories Corp.
American Electronics, Inc.
Barber-Colman Co.
Bodine Electric Co.
Bogue Electric Mfg. Co.
Celco-Constantine Engrg. Laboratories Co.
Diehl Mfg. Co.
Eastern Air Devices, Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Indicator Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Helipot Corp.
Instrument Motors
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co., Inc.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Motordyne Inc.
National Pneumatic Co., Inc.
*JOHN OSTER MFG. CO., AVIONIC DIV.
Servomechanisms, Inc., Mechatrol Div.
Small Motors Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Vickers Inc., Div.-Sperry Rand
*VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.
Wacline, Inc.

NUCLEAR PRODUCTS

American Electronics, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
*ANTON ELECTRONIC LABS., INC.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Bios Labs., Inc.
Consolidated Electrodynamics Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
Hertner Electric Co., The
Landsverk Electrometer Co.
Minneapolis-Honeywell Regulator Co.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Simpson Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.
United States Radium Corp.

Analyzers, Coincidence

BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Eldorado Electronics
Hamner Electronics Co., Inc.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Analyzers, Neutron Absorption

American Electronics, Inc.
Baird-Atomic, Inc.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Analyzers, Spectrum

BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Consolidated Electrodynamics Corp.
Demornay-Bonardi
Eldorado Electronics
General Electric Co., Apparatus Sales Div.
Hamner Electronics Co., Inc.
Northeastern Engrg. Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Assemblies, Shield

ACF Industries, Inc., Advanced Products Div.
Baird-Atomic, Inc.
Bar-Ray Products, Inc.
General Nuclear Corp.
Hamner Electronics Co., Inc.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Badges, Radiation

American Electronics, Inc..
Bar-Ray Products, Inc.
Eastman Kodak Co.
Landsverk Electrometer Co.
Gerard G. Leeds Co., Inc.
Nuclear-Chicago Corp.
Nuclear Corp of America, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
St. John X-Ray Laboratory
Sohl Co., The
Telectro Industries Corp.
Terminal Radio Corp.

Chambers, Alpha

*ANTON ELECTRONIC LABS., INC.
Baird-Atomic, Inc.
Landsverk Electrometer Co.
Nuclear-Chicago Corp.
Nuclear Corp of America, Inc.
Nuclear Measurements Corp.
Radiation Counter Labs., Inc.

Telectro Industries Corp.
Terminal Radio Corp.

Counters, Alpha

*ANTON ELECTRONICS LABS., INC.
Baird-Atomic, Inc.
Gerard G. Leeds Co., Inc.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Counters, Radiation

American Electronics, Inc.
*ANTON ELECTRONIC LABS., INC.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Landsverk Electrometer Co.
Menlo Research Lab.
Nuclear-Chicago Corp.
Nuclear Corp of America, Inc.
Nuclear Measurements Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Simpson Electric Co.
Stanley Aviation Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Counters, Scintillation

American Electronics, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Hamner Electronics Co., Inc.
Gerard G. Leeds Co., Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Simpson Electric Co.
Stanley Aviation Corp.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Crystal, Scintillation

American Electronics, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Bios Labs., Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Detectors, Scintillation

American Electronics, Inc.
Baird-Atomic, Inc.
Fisher Research Lab., Inc.
Hamner Electronics Co., Inc.
Menlo Research Lab.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Paterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Simpson Electric Co.
Stanley Aviation Corp.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Equipment, Nuclear Radiation

Acoustica Associates, Inc.
American Electronics, Inc.
*ANTON ELECTRONIC LABS., INC.
Baird-Atomic, Inc.
Bar-Ray Products, Inc.
Curtiss-Wright Corp., Electronics Div.
Eldorado Electronics
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
Jordan Electronics, Div.-Victoreen Instrument Co.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Nuclear-Chicago Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Riggs Nucleonic Co.
Simpson Electric Co.
Stanley Aviation Corp.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Indicators, Radiation

American Electronics, Inc.
*ANTON ELECTRONICS LABS., INC.
Baird-Atomic, Inc.
Curtiss-Wright Corp., Electronics Div.
General Nuclear Corp.
Jordan Electronics, Div.-Victoreen Instrument Co.
Landsverk Electrometer Co.
Menlo Research Lab.
Nuclear Corp. of America, Inc.
Nuclear Measurements Corp.
Riggs Nucleonic Co.
Simpson Electric Co.
Telectro Industries Corp.
Terminal Radio Corp.

Spectrometers

American Electronics, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Consolidated Electrodynamics Corp.
Eldorado Electronics
Hamner Electronics Co., Inc.
Instruments Div.-Philips Electronics, Inc.
Nuclear Corp. of America, Inc.
Process & Instruments
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Tubes, Gamma Ray

*ANTON ELECTRONIC LABS., INC.
Baird-Atomic, Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Tubes, Geiger Counter

*ANTON ELECTRONIC LABS., INC.
Baird-Atomic, Inc.
Instruments Div.-Philips Electronics, Inc.
Landsverk Electrometer Co.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Tubes, Scintillation

Baird-Atomic, Inc.
*COOPER DEVELOPMENT CORP.
Instruments Div.-Philips Electronics, Inc.
Nuclear-Chicago Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

OSCILLOGRAPHS

Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Centronix Inc.
Centrury Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Heiland Div.—Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
Precision Apparatus Co., Inc.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Multi-Channel

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Epic, Inc.
Grass Instrument Co.
Hamilton Watch Co., Hathaway Instrument Div
Heiland Div.—Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
Hogan Laboratories, Inc.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photron Instrument Co.
Railway Communications Inc.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Multi-Element

Burroughs Corp.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Heiland Div.-Minneapolis-Honeywell
Hogan Laboratories, Inc.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photron Instrument Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Portable

Brush Instruments, Div.-Clevite Corp.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
Edin Co., Inc.
General Electric Apparatus Sales Div.
Heiland Div.—Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photron Instrument Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Projection

Hickok Electrical Instrument Co., The
Skiatron Electronics & Television Corp.

Radar

Reeves Instrument Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Recording

Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Centronix Inc.
Century Electronics & Instuments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Electro-Medical Lab., Inc.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Hathaway Instrument Div.
Hamilton Watch Co., Military Products Div.
Heiland Div.—Minneapolis-Honeywell
Hogan Laboratories, Inc.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Panoramic Radio Products, Inc.
Photron Instrument Co.
Reeves Instrument Corp.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Transient Study

Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Edin Co., Inc.
General Electric Co., Apparatus Sales Div.
Heiland Div.—Minneapolis-Honeywell
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

OSCILLOMETERS

Electronic Measurements Corp.
Simpson Electric Co.

OSCILLOSCOPES

Advance Industries, Inc.
Aeroquip Corp.
Allegany Instrument Co., Inc.
American Electronic Labs., Inc.
Dunlap Electronics, Inc.
Edgerton, Germeshausen & Grier, Inc.
Feiler Engrg. & Mfg. Co.
Hickok Electrical Instrument Co., The
Industrial Television Inc.
Laboratory for Electronics, Inc.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Munston Mfg. & Service, Inc.
Precise Development Corp.
Precision Apparatus Co., Inc.
Railway Communications Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telechrome Mfg. Co.

PANELS, JACK

Accurate Electronics Corp., Dept D

Aerolite Electronics Corp.
Centronix Inc.
Eljay Corp.
General Railway Signal Co.
Hickok Electrical Instrument Co., The
Schaffer Air Industries, Inc.
Switchcraft, Inc.

PHASEMETERS

American Electronics, Inc., Data-Tronics Div.
Bergen Labs.
General Electric Co., Apparatus Sales Div.
Hallamore Electric Co.
Hammett Electric Co.
Simpson Electric Co.
Theta Instrument Corp.
Varo Mfg. Co.
Wintronics

PHASE ANALYZERS

American Electronics, Inc., Data-Tronics Div.
Bergen Labs.
General Electric Co., Apparatus Sales Div.
Simpson Electric Co.
Theta Instrument Corp.
Varo Mfg. Co.
Wintronics

PHOTOMETERS

Baird-Atomic, Inc.
Eldorado Electronics
Hammett Electric Co.
Jarrell-Ash Co.

PICKUPS, PRESSURE

Atlantic Research Corp.
BJ Electronics, Borg-Warner Corp.
Consolidated Electrodynamics Corp.
Datran Electronics, Div.—Mid-Continent Mfg., Inc.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Edcliff Instruments
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Endevco Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Haller Raymond & Brown Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Photocon Research Products
Trans-Sonics, Inc.
Ultradyne, Inc.

PICKUPS, TEMPERATURE

Advanced Electronics, Inc.
Allegany Instrument Co., Inc.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronic Processes Corp. of California
Fenwal Inc.
Flow Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Haller Raymond & Brown Inc.
Harco Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Simpson Electric Co.
Trans-Sonics, Inc.
United Control Corp.

PICKUPS, VIBRATION

Atlantic Research Corp.
Brush Instruments, Div.-Clevite Corp.
Chesapeake Instrument Corp.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Endevco Corp.
Georator Corp.
MB Mfg. Co.
Massa Labs., Inc.
Photocon Research Products
Herman Hosmer Scott, Inc.
Shure Brothers, Inc.
Southwestern Industrial Electronics Co.

PILOT LIGHT ASSEMBLIES

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Alden Products Co.
Cutler-Hammer Inc.
Eldema Corp.
General Electric Co., Appartus Sales Div.
Grimes Mfg. Co.
Signalite Inc.
Simpson Electric Co.
Sylvania Electric Products Inc., Parts Div.

POSTS, BINDING

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Affiliated Screw Products Co.
Elco Corp.
Electro-Tech Equipment Co.
General Railway Signal Co.
Georator Corp.
E. F. Johnson Co.
Litton Industries, Components Div.
Malco Tool & Mfg. Co.
Superior Electric Co., The
Waldom Electronics Inc.

POTENTIOMETER TRIMMERS

Ace Electronics Associates, Inc.
Borg Equipment Div.-The George W. Borg Corp.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Joe Davidson & Associates
Edcliff Instruments
Fairchild Controls Corp., Components Div.
General Controls Co.
Helipot Corp.
Gerard G. Leeds Co., Inc.
Tucson Instrument Corp.

POTENTIOMETERS

Allegany Instrument Co., Inc.
American Electronics, Inc.
Analogue Controls, Inc.
Borg Equipment Div.-The George W. Borg Corp.
Brush Instruments, Div.-Clevite Corp.
Chicago Telephone Supply Corp.
Dale Products, Inc.
Joe Davidson & Associates
R. C. Dudek & Co.
Dwyer Engrg. Co., Inc.
Edcliff Instruments
Electro-Measurements Inc.
Fairchild Controls Corp., Components Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Controls Co.
General Electric Co., Apparatus Sales Div.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Librascope Inc.
Markite Corp.
Perkin-Elmer Corp.
Servonic Instruments, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.

Absolute Pressure

Computer Instruments Corp.
Edcliff Instruments
Fairchild Controls Corp., Components Div.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Iron Fireman Mfg. Co., Electronics Div.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Rahm Instruments, Div.-American Machine & Metals, Inc.
Servonic Instruments, Inc.
Trans-Sonics, Inc.

Differential Pressure

Computer Instruments Corp.
Edcliff Instruments
Fairchild Controls Corp., Components Div.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Iron Fireman Mfg. Co., Electronics Div.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Rahm Instruments, Div.-American Machine & Metals, Inc.
Servonic Instruments, Inc.
Trans-Sonics, Inc.

High Resistance

Ace Electronics Associates, Inc.
Dale Products, Inc.
Fairchild Controls Corp., Components Div.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Markite Corp.
Servonic Instruments, Inc.
Spectrol Electronics Div., Carrier Corp.
Tucson Instrument Corp.

High Voltage

Dale Products, Inc.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Markite Corp.
Servonic Instrumetns, Inc.
Tucson Instrument Corp.

Induction

American Electronics, Inc.
G. L. Collins Corp.
Diehl Mfg. Co.
Helipot Corp.
Servonic Instruments, Inc.

Metallic Film

Chicago Telephone Supply Corp.
Fairchild Controls Corp., Components Div.
General Electric Co., Apparatus Sales Div.
Helipot Corp.
Gerard G. Leeds Co., Inc.
Zenith Optical Laboratory

Portable Instrument

Allegany Instrument Co., Inc.
Clarostat Mfg. Co., Inc.
Gray Instrument Co.
Humphrey, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Non-Linear Systems Inc.
Westronics Inc.

Precision

Ace Electronics Associates, Inc.
Allegany Instrument Co., Inc.
American Electronics, Inc.
Analogue Controls, Inc.
Borg Equipment Div.-The George W. Borg Corp.
Clarostat Mfg. Co., Inc.
Computer Instruments Corp.
Dale Products, Inc.
Joe Davidson & Associates
R. C. Dudek & Co.
Dwyer Engrg. Co., Inc.
Electro-Measurements Inc.
Fairchild Controls Corp., Components Div.
General Controls Co.
Gray Instrument Co.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Markite Corp.
Minco Products, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Non-Linear Systems Inc.
Osborne Electronic Sales Corp.
Perkin-Elmer Corp.
Servonic Instruments, Inc.
Spectrol Electronics Div., Carrier Corp.
Tucson Instrument Corp.
U. S. Gauge Div.-American Machine & Metals Inc.

Printed Circuit

Ace Electronics Associates, Inc.
Dale Products, Inc.
Dwyer Engrg. Co., Inc.
Gerard G. Leeds Co., Inc.
P. R. Mallory & Co. Inc.
Naz-Dar Co.
Zenith Optical Laboratory

Rectilinear

Ace Electronics Associates, Inc.
Clarostat Mfg. Co., Inc.
Computer Instruments Corp.
Edcliff Instruments
Fairchild Controls Corp., Components Div.
General Controls Co.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Markite Corp.
Minco Products, Inc.
Servonic Instruments, Inc.
Tucson Instrument Corp.

Slidewire

Analogue Controls, Inc.
Electronic Associates, Inc.
General Controls Co.
Georator Corp.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.

POWER ABSORBERS

Metavac, Inc.
McMillan Industrial Corp.
Radar Design Corp.
Sun Electric Corp.
United Mfg. Co. Div., The W. L. Maxson Corp.
Wacline, Inc.

PRECIPITATORS, ELECTROSTATIC

Hammett Electric Co.
Koppers Co., Inc., Metal Products Div.

PRESSURE INSTRUMENTS

***AEROTEST LABORATORIES, INC.**
Century Electronics & Instruments, Inc.
Consolidated Electrodynamics Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Edcliff Instruments
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro Products Labs., Inc.
Ellison Draft Gage Co.
Fairchild Controls Corp., Components Div.
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.

Greenleaf Mfg. Co., The, Div.-Mandrel In[illegible]
Haller Raymond & Brown Inc.
***WALLACE O. LEONARD, INC.**
Minneapolis-Honeywell Regulator Co., Indust. Div.
Northam Electronics, Inc.
Scientific Instrument Co.
Trimount Instrument Co.
Ultradyne, Inc.
Weksler Instrument Corp.

PROBES, PRESSURE

Aero Research Instrument Co. Inc.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Edcliff Instruments
Ellison Draft Gage Co.
Flow Corp.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Haller Raymond & Brown Inc.
Harco Labs., Inc.
Scientific Instrument Co.
Task Corp.

PROBES, TEMPERATURE

Advanced Electronics, Inc.
Aero Research Instrument Co. Inc.
Allegany Instrument Co., Inc.
Cardinal Instrumentation Corp.
Consolidated Controls Corp.
Dynametrics Corp.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electronic Processes Corp. of California
Fenwal Inc.
Flow Corp.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Haller Raymond & Brown Inc.
Harco Labs., Inc.
Illinois Testing Laboratories, Inc.
Scientific Instrument Co.
Simpson Electric Co.
Victory Engineering Corp.

PSYCHOGALVANOMETERS

Associated Research, Inc.
Electro-Medical Lab., Inc.
Hammett Electric Co.
Offner Electronics Inc.

PSYCHROMETERS

Cambridge Instrument Company, Inc.
Consolidated Avionics Corp.
E. Vernon Hill & Co.
Instruments Corp., The
Palmer Thermometers, Inc.
Scientific Instrument Co.
Weksler Instrument Corp.

PYROMETERS, OPTICAL

Electro-Tech Equipment Co.
Epic, Inc.
Leeds & Northrup Co.
Pyrometer Instrument Co., Inc.

PYROMETERS, RADIATION

Electro-Tech Equipment Co.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Perkin-Elmer Corp.
Pyrometer Instrument Co., Inc.
Servo Corp. of America

PYROMETERS, RESISTANCE

Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hickok Electrical Instrument Co., The
Illinois Testing Laboratories, Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.

RADAR TEST SETS

Adler Electronics, Inc.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
Chemalloy Electronics Corp.
Consolidated Avionics Corp.
***COOPER DEVELOPMENT CORP.**
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Daven Co., The
Demornay-Bonardi
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
General Communication Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Mechanical Div.-General Mills, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Optimized Devices, Inc.
***PACKARD-BELL ELECTRONICS CORP.**
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Simpson Electric Co.
Stromberg-Calson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
***TELERAD MFG. CORP.**
Telonic Industries, Inc.
Vectron, Inc.
Wacline, Inc.
***WASHINGTON ALUMINUM CO., INC.**
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

RADIATION DETECTORS

American Electronics, Inc.
Baird-Atomic, Inc.
Cambridge Instrument Company, Inc.
***COOPER DEVELOPMENT CORP.**
Fisher Research Lab., Inc.
General Electric Co., Apparatus Sales Div.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Nuclear-Chicago Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Radiation Counter Labs., Inc.
St. John X-Ray Laboratory
Simpson Electric Co.
Stanley Aviation Corp.
Telectro Industries Corp.

RADIATION EQUIPMENT, NUCLEAR

American Electronics, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Bar-Ray Products, Inc.
Eldorado Electronics
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
Gerard G. Leeds Co., Inc.
Nuclear-Chicago Corp.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Simpson Electric Co.
Stanley Aviation Corp.
Telectro Industries Corp.
United States Radium Corp.

RADIOACTIVITY EQUIPMENT

BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
General Nuclear Corp.
Jordan Electronics, Div.-Victoreen Instrument Co.
Gerard G. Leeds Co., Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Radiation Counter Labs., Inc.
Radiation Instrument Development Laboratory, Inc.
Telectro Industries Corp.
United States Radium Corp.

RECORDERS

Advanced Products Co., The
Alden Electronic & Impulse Recording Equip. Co.
Allegany Instrument Co., Inc.
American Electronics, Inc.
Baird-Atomic, Inc.
Barton Instrument Corp.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
F. W. Corbett Science Labs.
Dynac, Inc.
Haller Raymond & Brown Inc.
Haydon Div.-General Time Corp.
Heiland Div.-Minneapolis-Honeywell
Leeds & Northrup Co.
Librascope Inc.
Maico Electronics, Inc.
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Reeves Instrument Corp.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Thompson-Ramo-Wooldridge Products Co., The
Westronics Inc.

Depth

Chesapeake Instrument Corp.
Kearfott Co., Inc.
Pacific Div.-Bendix Aviation Corp.
Skiatron Electronics & Television Corp.

Film Thickness

Curtiss-Wright Corp., Electronics Div.
Electric Eye Equipment Co.
Nuclear Corp. of America, Inc.

Fluid Conductivity, Electronic

Industrial Instruments Inc.
Research Appliance Co.

Frequency

Alden Electronic & Impulse Recording Equip. Co.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Dynac, Inc.
Heiland Div.-Minneapolis-Honeywell
Kay Electric Co.
Laboratory for Electronics, Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Offner Electronics Inc.
Potter Aeronautical Corp.
***RADIATION, INC.**
Sound Apparatus Co.
Systron Corp.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Westronics Inc.

Frequency Response

Alden Electronic & Impulse Recording Equip. Co.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Heiland Div.-Minneapolis-Honeywell
Kay Electric Co.
Minneapolis-Honeywell Regulator Co.-Davies Div.
Photron Instrument Co.
Potter Aeronautical Corp.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Sound Apparatus Co.
Varo Mfg. Co.

Liquid Level, Electronic

Acoustica Associates, Inc.
Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Auburn Spark Plug Co., Inc.
Centronix Inc.
Curtiss-Wright Corp., Electronics Div.
Fischer & Porter Co.
Gilmore Industries Inc.
Haller Raymond & Brown Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Narda Ultrasonics Corp., The
Nuclear Corp. of America, Inc.

Magnetic, Mobile Comm.

American Electronics, Inc., Data-Tronics Div.
Autonetics, Div.-North American Aviation, Inc.
Consolidated Electrodynamics Corp.
Electromation Co.
International Radio & Electronics Corp.
Kinevox-Hallen
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Materials Thickness, Electronic

Consolidated Avionics Corp.
Curtiss-Wright Corp., Electronics Div.
Daytronic Corp.
Electric Eye Equipment Co.
Leeds & Northrup Co.

Mechanical

Gorrell & Gorrell
Hagan Chemicals & Controls, Inc.
Hamilton Watch Co., Military Products Div.
Hogan Laboratories, Inc.
Soroban Engrg., Inc.
Technical Oil Tool Corp.

Potentiometers

Analogue Controls, Inc.
F. W. Corbett Science Labs.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hagan Chemicals & Controls, Inc.
Leeds & Northrup Co.

Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Westronics Inc

Power Level

Airborne Instruments Lab., Inc.
Antlab Inc.
General Electric Co., Apparatus Sales Div.
Reeves Instrument Corp.
Sound Apparauts Co.
*WESTINGHOUSE ELECTRIC CORP.

Pressure, Electronic

Allegany Instrument Co., Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Barton Instrument Corp.
Century Electronics & Instruments, Inc.
Consolidated Electrodynamics Corp.
Fischer & Porter Co.
Gilmore Industries Inc.
Hagan Chemicals & Controls, Inc.
Haller Raymond & Brown Inc.
Heiland Div.—Minneapolis-Honeywell
Leeds & Northrup Co.
Sanborn Co.
Systron Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Sound Level

Brush Instruments, Div.-Clevite Corp.
Chesapeake Instrument Corp.
Kay Electric Co.
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Sanborn Co.
Simpson Electric Co.
Sound Apparatus Co.

Specific Gravity, Electronic

Fischer & Porter Co.
Gilmore Industries Inc.
Potter Aeronautical Corp.

Strain

Allegany Instrument Co., Inc.
B & F Instruments, Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Brush Instruments, Div.-Clevite Corp.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
James Cunningham Son & Co., Inc.
Daytronic Corp.
Gilmore Industries Inc.
Gray Mfg. Co., The
Heiland Div.-Minneapolis-Honeywell
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics Inc.
Photron Instrument Co.
Sanborn Co.

Tape and Wire

American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Amplifier Corp. of America
Consolidated Electrodynamics Corp.
Electromation Co.
General Kinetics, Inc.
Gray Mfg. Co., The
International Radio & Electronics Corp.
Kinevox-Hallen
Maico Electronics, Inc.
Master Tape Printers
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Seeburg Corp., The
Soroban Engrg., Inc.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Thompson Products, Inc.

Temperature, Electronic

Allegany Instrument Co., Inc.
Avien, Inc.
Cardinal Instrumentation Corp.
Century Electronics & Instruments, Inc.
James Cunningham Son & Co., Inc.
Curtiss-Wright Corp., Electronics Div.
Gilmore Industries Inc.
Hagan Chemicals & Controls, Inc.
Hallikainen Instruments
Heiland Div.-Minneapolis-Honeywell
Minneapolis-Honeywell Regulator Co., Indust. Div.
Leeds & Northrup Co.
Offner Electronics Inc.
Research Appliance Co.
Simpson Electric Co.
Telectro Industries Corp.
Thermo Electric Co., Inc.
Westronics Inc.

Timing

Advanced Products Co., The
Alden Electronic & Impulse Recording Equip. Co.
Alden Systems Co.
Allegany Instrument Co., Inc.
Bergen Labs.
Centronix Inc.
Computer-Measurements Corp.
Consolidated Avionics Corp.
M. Ducommun Co.
General Electric Co., Apparatus Sales Div.
Gilmore Industries Inc.
Gorrell & Gorrell
Haydon Div.-General Time Corp.
*RADIATION, INC.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.
Systron Corp.
Technical Oil Tool Corp.

Torque, Electronic

Allegany Instrument Co., Inc.
B & F Instruments, Inc.
Baldwin-Lima-Hamilton Corp., Electroncis & Instrumentation Divs.
Bergen Labs.
Century Electronics & Instruments, Inc.
Gilmore Industries Inc.
Heiland Div.—Minneapolis-Honeywell
Minneapolis-Honeywell Regulator Co., Indust. Div.

Transient

Allegany Instrument Co., Inc.
Bergen Labs.
Brush Instruments, Div.-Clevite Corp.
Edgerton, Germeshausen & Grier, Inc.
Kay Electric Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
*RADIATION, INC.

Vacuum

Central Electronics Mfgrs., Inc.
Consolidated Electrodynamics Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Nuclear Corp. of America, Inc.
U. S. Gauge Div.,-American Machine & Metals, Inc.

Vibration

Brush Instruments, Div.-Clevite Corp.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidtaed Electrodynamics Corp.
Epic, Inc.
Heiland Div.—Minneapolis-Honeywell
Impact-O-Graph Corp., The
Kay Electric Co.
Minneapolis-Honeywell Regulator Co.-Davies Laboratories Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Southwestern Industrial Electronics Co.

Weight, Electronic

Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Curtiss-Wright Corp., Electronics Div.
Gilmore Industries Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
*RADIATION, INC.

X-Y

Alden Electronic & Impulse Recording Equip Co.
Analogue Controls, Inc.
Antlab Inc.
Benson-Lehner Corp.
California Computer Products
Chesapeake Instrument Corp.
F. W. Corbett Science Labs.
Electro Instruments, Inc.
Electronic Associates, Inc.
Fenske Fedrick & Miller Co.
Gilmore Industries Inc.
Gorrell & Gorrell
Leeds & Northrup Co.
Librascope Inc.
Magnavox Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
*RADIATION, INC.
Reeves Instrument Corp.
Sanborn Co.
Tally Register Corp.

REVERBERATION UNITS

Centronix Inc.
International Research Associates
Winder Aircraft Corp. of Fla.

SALT BATHS

Associated Testing Labs., Inc.
John Gombos Co., Inc.
General Electric Co., Apparatus Sales Div.
Hallikainen Instruments
A. F. Holden Co., The
E. F. Houghton & Co.
Papesch & Kolstad, Inc.
Winder Aircraft Corp. of Fla.

SHOCK TUBES

Finn Aeronautical Div., T. R. Finn & Co., Inc.
Flow Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.

SHOCK TUNNELS

Finn Aeronautical Div., T. R. Finn & Co., Inc.
R. C. Mahon Co., The

SIMULATORS, FLIGHT

Chicago Div., American Bosch Arma Corp.
*COOPER DEVELOPMENT CORP.
Davidson Mfg. Co.
Electronic Associates, Inc.
Hallamore Electronics Co.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
*RHEEM MFG. CO., ELECTRONICS DIV.
Seeburg Corp., The
Stanley Aviation Corp.
Task Corp.
Thompson-Ramo-Wooldridge Products Co., The
*WASHINGTON ALUMINUM CO., INC.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Winder Aircraft Corp. of Fla.

SLIDING LOADS, MICROWAVE

Bogart Mfg. Corp.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Douglas Microwave Co., Inc.
Omega Labs., Inc.

SPECTROMETERS

American Electronics, Inc.
Applied Research Labs.
Baird-Atomic, Inc.
Barnes Engineering Co.
*BAUSCH & LOMB OPTICAL CO.
Brush Instruments, Div.-Clevite Corp.
Consolidated Electrodynamics Corp.
Davidson Mfg. Co.
Epic, Inc.
J. W. Fecker, Inc., Sub.—American Optical Co.
Jarrell-Ash Co.
Leeds & Northrup Co.
Librascope Inc.
National Spectrograph Labs., Inc.
Perkin-Elmer Corp.
Process & Instruments

SPECTROPHOTOMETERS

Baird-Atomic, Inc.
*BAUSCH & LOMB OPTICAL CO.
J. W. Fecker, Inc., Sub.—American Optical Co.
General Electric Co., Apparatus Sales Div.
Jarrell-Ash Co.
Librascope Inc.
National Spectrographic Labs., Inc.
Optomechanisms Inc.
Perkin-Elmer Corp.
Process & Instruments
Telechome Mfg. Corp.

SPECTROSCOPIC EQUIPMENT

Applied Research Labs.
Baird-Atomic, Inc.
*BAUSCH & LOMB OPTICAL CO.
Consolidated Electrodynamics Corp.
J. W. Fecker, Inc., Sub.—American Optical Co.
Jarrell-Ash Co.
Librascope Inc.
National Spectrographic Labs., Inc.
Optomechanisms Inc.
Process & Instruments

SPRINGS, INSTRUMENT HAIRSPRINGS

W. L. Barrett Co., The
Hamilton Watch Co., Military Products Div.
Pic Design Corp., Sub.—Benrus Watch Co., Inc.

SPRINGS, KNOB

Ace Spring Mfg. Co., Inc.
W. L. Barrett Co., The
Beede Electrical Instrument Co. Inc.
Hamilton Watch Co., Military Products Div.
Leetronics, Inc.
Newcomb Spring of Conn. Inc.
Reliable Spring & Wire Forms Co., The

STANDARDS

Allegany Instrument Co., Inc.
Barnes Development Co.
Boonton Radio Corp.
Davenport Mfg. Co.
Electro-Measurements Inc.
Leeds & Northrup Co.
Specific Products
Winder Aircraft Corp. of Fla.

. . . test equipment

Capacitance

Barnes Development Co.
Boonton Electronics Corp.
Georator Corp.
Leeds & Northrup Co.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Equipment, Calibration

Curtiss-Wright Corp., Industrial & Scientific Products Div.
Demornay-Bonardi
Dunlap Electronics, Inc.
G. W. Galloway Co.
General Electric Co., Apparatus Sales Div.
Hallikainen Instruments
Telectro Industries Corp.
Weinschel Engrg.
Winder Aircraft Corp. of Fla.

Frequency

James G. Biddle Co.
D & R, Ltd.
Demornay-Bonardi
Dunlap Electronics, Inc.
Georator Corp.
Gertsch Products Inc.
Manson Laboratories, Inc.
Marconi Instruments
Specific Products
Systron Corp.
Thompson Products, Inc.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

Inductance

Georator Corp.
Leeds & Northrup Co.
United Transformer Corp.
Winder Aircraft Corp. of Fla.

Laboratory Time

M. Ducommun Co.
Georator Corp.
Hamilton Watch Co., Military Products Div.
Winder Aircraft Corp. of Fla.

Phase

Acton Laboratories Inc.
Theta Instrument Corp.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.
Wirtonics

Resistance

Barnes Development Co.
James G. Biddle Co.
Electro-Measurements Inc.
Georator Corp.
Gray Instrument Co.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Tel-Labs, Inc.
Winder Aircraft Corp. of Fla.

Temperature

Cardinal Instrumentation Corp.
Hallikainen Instruments
Harco Labs., Inc.
Leeds & Northrup Co.
Palmer Thermometers, Inc.
Philco Corp., Government & Industrial Divs.
Scientific Instrument Co.
Weksler Instrument Corp.
Winder Aircraft Corp. of Fla.

Time

Allegany Instrument Co., Inc.
M. Ducommun Co.
Georator Corp.
Hamilton Watch Co., Military Products Div.
Specific Products
Winder Aircraft Corp. of Fla.

Voltage

Airtron, Inc.
Avien, Inc.
Consolidated Controls Corp.
Davenport Mfg. Co.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Holt Instrument Laboratories, Div. Holt Hardwood Co., Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Owen Labs., Inc.
***RADIATION, INC.**
Southwestern Industrial Electronics Co.
Winder Aircraft Corp. of Fla.

STANDS, MICROPHONE

Champion Airquipment Inc.
Telectro Industries Corp.

STANDS, TEST

ACF Industries, Inc., Advanced Products Div.
Aero-Test Equipment Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Anchor Specialty Mfg. Co. Inc.
Canoga Corp. of California
Champion Airquipment Inc.
Champion Co., The
Coleman Engrg. Co., Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
***COOPER DEVELOPMENT CORP.**
Denison Engrg. Div., American Brake Shoe Co.
G. M. Dykes Iron Works, Inc.
Dynametrics Corp.
G. W. Galloway Co.
Greenbrier Instruments Inc
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hallamore Electronics Co.
Idea Aerosmith, Inc.
***KAHN & CO., INC.**
Kaiser Steel Corp., Fabricating Div.
Lear, Inc.
Loewy-Hydropress, Div.—Baldwin-Lima Hamilton
Luria Engrg. Co.
R. C. Mahon Co., The
Parameters, Inc.
Philips & Davies Inc.
Pioneer-Central Div., Bendix Aviation Corp.
***REGENT JACK MFG. CO., INC.**
Research Controls
Research, Inc.
Rucker Co., The
Schaffer Air Industries, Inc.
Scientific Instrument Co.
Shaw Metal Products Corp.
Sprague Engrg. Corp.
Stanley Aviation Corp.
Telectro Industries Corp.
Theta Instrument Corp.
Thompson-Ramo-Wooldridge Products Co., The
United Mfg. Co. Div., The W. L. Maxson Corp.
Vickers Inc., Div.-Sperry Rand
***VICKERS INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Warren Mfg. Div., Warren Brothers Roads Co.
Winder Aircraft Corp. of Fla.

STANDS, WAVEGUIDE

Aircom Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Canoga Corp. of California
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Douglas Microwave Co., Inc.
J-V-M Microwave Co.
Narda Microwave Corp., The
Omega Labs., Inc.
Telectro Industries Corp.
Uniwave, Inc.
Winder Aircraft Corp. of Fla.

STATIC ELIMINATORS

Merix Chemical Co.
Telectro Industries Corp.
United States Radium Corp.

STATORS, MOTOR & GENERATOR

American Welding & Mfg. Co., The
Bogue Electric Mfg., Co.
Celco-Constantine Engrg. Laboratories Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Eicor Div.-F. L. Jacobs Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Task Corp.

STRAIN GAUGES

Aero Research Instrument Co. Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Consolidated Electrodynamics Corp.
Daytronic Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
General Electric Co., Apparatus Sales Div.
Gilmore Industries Inc.
Gulton Industries, Inc.
St. John X-Ray Laboratory
Thieblot Aviation Co., Div.-Vitro Corp. of America

STRAIN RELIEFS

Amatom Electronic Hardware Co. Inc.

STROBOSCOPE, SYNCHRONIZER

Chadwick-Helmuth Co.
Hickok Electrical Instrument Co., The
Skiatron Electronics & Television Corp.
Sun Electric Corp.

STROBOSCOPES

Davenport Mfg. Co.
Edgerton, Germeshausen & Grier, Inc.
Epic, Inc.
Georator Corp.
Graflex, Inc.
Hickok Electrical Instrument Co., The
Kemlite Laboratories, Inc.
Skiatron Electronics & Television Corp.
Slaughter Co., Inc.
Sun Electric Corp.

SWITCHES

***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH MFG. CO.**

SWITCHING EQUIPMENT, CAMERA

Abrams Instrument Corp.
James Cunningham Son & Co., Inc.
Librascope Inc.
J. A. Maurer, Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
***MISSILE COMPONENTS GROUP, ELECTRO—SNAP SWITCH & MFG. CO.**
Thompson Products, Inc.

SYNCHROS

American Electronics, Inc.
Clifton Precision Products Co., Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div—McGraw-Edison Co.
Electric Auto-Lite Co., The
Electric Indicator Co., Inc.
Helipot Corp.
***JOHN OSTER MFG. CO., AVIONIC DIV.**
Servomechanisms, Inc., Mechatrol Div.

SYNCHROSCOPES

General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Lavoie Labs., Inc.
Skiatron Electronics & Television Corp.
Sun Electric Corp.

SYSTEMS, REMOTE CONTROL

American Electronics, Inc., Data-Tronics Div.
American Research & Mfg. Corp.
Bendix Aviation Corp., York Div.
Burroughs Corp.
***COOPER DEVELOPMENT CORP.**
James Cunningham Son & Co., Inc.
***DATA-CONTROL SYSTEMS INC.**
Dwyer Engrg. Co., Inc.
Dynac, Inc.
Dynametrics Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
J. W. Fecker, Inc., Sub.—American Optical Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
North Atlantic Industries, Inc.
***KAHN & CO., INC.**
Librascope Inc.
Reeves Instrument Corp.
Rucker Co., The
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Thompson-Ramo-Wooldridge Products Co., The
Tucson Instrument Corp.
Varo Mfg. Co.

TABS

Master Tape Printers
Sohl Co., The
Star Engraving Co., Ltd.
Techniques, Inc.

TABS, DIAL ACCESS

Master Tape Printers
Sohl Co., The
Star Engraving Co., Ltd
Techniques, Inc.

TACHOMETER DRIVES

Arch Gear Works Inc.
Geartronics Corp.
I-L-S Instrument Corp.
Master Tape Printers
Potter Aeronautical Corp.
Reeves Instrument Corp.
Servomechanisms, Inc., Mechatrol Div.
Sun Electric Corp.
Uniwave, Inc.

TACHOMETERS

American Electronics Inc.

Associated Research, Inc.
Bgoue Electric Mfg., Co.
Cardinal Instrumentation Corp.
Consolidated Airborne Systems, Inc.
Diehl Mfg. Co.
Dynac, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
Epic, Inc.
Geartronics Corp.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
I-L-S Instrument Corp.
Ideal Industries Inc.
Instruments Corp., The
Kearfott Co., Inc.
Maico Electronics, Inc.
Metron Instrument Co.
Potter Aeronautical Corp.
Servomechanisms, Inc., Mechatrol Div.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Technical Oil Tool Corp.
Uniwave, Inc.
Wacline, Inc.

TACHOMETERS, ELECTRONIC

American Electronics, Inc.
Burroughs Corp., Electronic Tube Div.
Cardinal Instrumentation Corp.
Consolidated Airborne Systems, Inc.
Dynac, Inc.
Electro Products Labs., Inc.
Erie Resistor Corp.
Georator Corp.
Hammett Electric Co.
I-L-S Instrument Corp.
Kearfott Co., Inc.
North Atlantic Industries, Inc.
Optomechanisms Inc.
Potter Aeronautical Corp.
Servomechanisms, Inc., Mechatrol Div.
Simpson Electric Co.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Uniwave, Inc.
Varo Mfg. Co.
Wacline, Inc.
Westronics Inc.

TAPES, TEST

Hamilton Watch Co., Military Products Div.
Master Tape Printers
Sohl Co., The
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

TEMPERATURE MEASURING EQUIPMENT

Allegany Instrument Co., Inc.
Assembly Products, Inc.
Auto-Control Labs., Inc.
Avien, Inc.
Barnes Engineering Co.
Brush Instruments, Div.-Clevite Corp.
CDC Control Services, Inc.
Cardinal Instrumentation Corp.
Consolidated Avionics Corp.
Conosolidated Controls Corp.
*COOPER DEVELOPMENT CORP.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronic Control Corp.
Electro-Tech Equipment Co.
Epic, Inc.
Ewald Instruments
Fairfield Engineering Corp.
Fenwal Inc.
Fischer & Porter Co.
Flow Corp.
Friez Instrument Div.-Bendix Aviation Corp.
*GARRETT CORP., THE AIRESEARCH MFG. DIVS.
General Electric Co., Apparatus Sales Div.
Hagan Chemicals & Controls, Inc.
Hallikainen Instruments
E. Vernon Hill & Co.
Illinois Testing Laboratories Inc.
Instruments Corp., The
*KAHN & CO., INC.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Jas. P. Marsh Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Palmer Thermometers, Inc.
Royco Instruments
Scientific Instrument Co.
Simpson Electric Co.
Thermo Electric Co., Inc.
Trans-Sonics, Inc.
Victory Engineering Corp.
Weksler Instrument Corp.
Westronics Inc.

TEMPERATURE RESISTANCE BULBS

Cardinal Instrumentation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Friez Instrument Div.-Bendix Aviation Corp.
Hallikainen Instruments
Illinois Testing Laboratories, Inc.

Leeds & Northrup Co.
Lewis Engrg. Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div
Rosemount Engrg. Co.
Thermo Electric Co., Inc.
Trans-Sonics, Inc.
United Control Corp.

TEST CHAMBERS, ENVIRONMENTAL

Aero-Test Equipment Co., Inc.
*AEROTEST LABORATORIES, INC.
Aireco, Inc.
Anchor Specialty Mfg. Co., Inc.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
CDC Control Services, Inc.
Cincinnati Sub Zero Products
*CONRAD, INC.
Consolidated Electrodynamics Corp., Rochester Div.
Environmental Equipment Co.
G. W. Galloway Co.
Guardite Co., Div. of American-Marietta Co.
Harris Refrigeration Co.
International Radiant Corp.
Mantec Inc.
Mast Development Co., Inc.
Murphy & Miller Inc.
NRC Equipment Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CO.
Rototest Labs., Inc.
Standard Cabinet Co.
Tenney Engrg., Inc.
Warren Mfg. Div., Warren Brothers Roads Co.

TEST CHAMBERS, FLIGHT SIMULATION

Aero-Test Equipment Co., Inc.
*AEROTEST LABORATORIES, INC.
Aireco, Inc.
Associated Testing Labs., Inc.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
CDC Control Services, Inc.
California Technical Industries, Div.-Textron Inc.
G. W. Galloway Co.
Gates Electronic Co.
Guardite Co., Div. of American-Marietta Co.
*KAHN & CO., INC.
Mantec Inc.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Rototest Labs., Inc.
Tenney Engrg., Inc.

TEST EQUIPMENT

Accessory Controls & Equipment Corp.
Advance Industries, Inc.
Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Anchor Specialty Mfg. Co. Inc.
Arnoux Corp.
Associated Research, Inc.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., Red Bank Div.
Browning Laboratories, Inc.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
CDC Control Services, Inc.
*CONRAD, INC.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Dit-Mco, Inc., Electronics Div.
Dwyer Engrg. Co., Inc.
Dynac, Inc.
Environmental Equipment Co.
G. W. Galloway Co.
Gardner Laboratory, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gates Electronic Co.
General Communication Co.
Goodyear Aircraft Corp.
Gremco, Inc.
Heiland Div.-Minneapolis-Honeywell
Hicks Corp., The
E. Vernon Hill & Co.
Hunter Spring Co.
Instrument Laboratories
*KAHN & CO., INC.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Manson Laboratories, Inc.
Mantec Inc.
Motorola Inc., Military Marketing Div.
Murphy & Miller Inc.
Opad Electric Co.
Polarad Electronics Corp.
Precison Apparatus Co., Inc.
Resdel Engrg. Corp.
Rototest Labs., Inc.
Milton Roy Co.
St. John X-Ray Laboratory

Simpson Electric Co.
Specific Products
Sun Electric Corp.
Task Corp.
Tel-Instrument Electronics Corp.
Thompson-Ramo-Wooldridge Products Co., The
Wacline, Inc.
Winder Aircraft Corp. of Fla.

Accelerator

*AEROTEST LABORATORIES, INC.
*AMERICAN MACHINE & FOUNDRY CO.
Anchor Specialty Mfg. Co. Inc.
Associated Testing Labs., Inc.
Brubaker Electronics, Inc., Sub--Telecomputing Corp.
CDC Control Services, Inc.
Epic, Inc.
Geisler Labs.
Hamilton Watch Co., Military Products Div.
Royal Industries, Inc.
Rucker Co., The
Warren Mfg. Div., Warren Brothers Roads Co.
Wave Particle Corp.
Winder Aircraft Corp. of Fla.

Altitude Simulating

Acton Laboratories Inc.
Aero-Test Equipment Co., Inc.
*AEROTEST LABORATORIES, INC.
Associated Testing Labs., Inc.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
CDC Control Services, Inc.
California Technical Industries, Div.-Textron Inc.
*CONRAD, INC.
J. P. Devine Mfg. Co.
Environmental Equipment Co.
G. W. Galloway Co.
*GREER HYDRAULICS, INC.
Guardite Co., Div. of American-Marietta Co.
Hallamore Electronics Co.
Hicks Corp., The
Intercontinental Dynamics Corp.
International Radiant Corp.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
*WALLACE O. LEONARD, INC.
Link Aviation, Inc.
Mantec Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Missimers Inc.
NRC Equipment Corp.
Rototest Labs., Inc.
Rucker Co., The
Schaffer Air Industries, Inc.
Standard Cabinet Co.
Tenney Engrg., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg. Div., Warren Brothers Roads Co.
Winder Aircraft Corp. of Fla.

Aural

Associated Testing Labs., Inc.
General Sound Control, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Western Electro-Acoustic Lab.

Aviation

Aero-Test Equipment Co., Inc.
*AEROTEST LABORATORIES, INC.
Anchor Specialty Mfg. Co. Inc.
Associated Testing Labs., Inc.
Brush Instruments, Div.-Clevite Corp.
CDC Control Services, Inc.
Champion Airquipment Inc.
Coleman Engrg. Co., Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
Consolidated Electrodynamics Corp.
G. W. Galloway Co.
General Sound Control, Inc.
*GREER HYDRAULICS, INC.
Hallamore Electronics Co.
Harman Equipment Co.
Heiland Div.-Minneapolis-Honeywell
Intercontinental Dynamics Corp.
*KAHN & CO., INC.
Kearfott Co., Inc.
Mantec Inc.
Mercury International Industries Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
George L. Nankervis Co.
Pioneer-Central Div., Bendix Aviation Corp.
*RHEEM MFG. CO., ELECTRONICS DIV.
Schaffer Air Industries, Inc.
Strata Instrument Co.
Sun Electric Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson-Ramo-Wooldridge Products Co., The
Wells Industries Corp.

Centrifuge

*AEROTEST LABORATORIES, INC.
Aircraft Armaments, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Anchor Specialty Mfg. Co., Inc.
Associated Testing Labs., Inc.
Coleman Engrg. Co., Inc.
*GREER HYDRAULICS, INC.
Hamilton Watch Co., Military Products Div.
Hicks Corp., The
Magnavox Co., The
Raymond Engrg. Laboratory, Inc.
Rototest Labs., Inc.
Royal Industries, Inc.
Rucker Co., The
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg. Div., Warren Brothers Roads Co.

Combustion

*AEROTEST LABORATORIES, INC.
Associated Testing Labs., Inc.
CDC Control Services, Inc.
Electronics Corp. of America
Gates Electronic Co.
General Sound Control, Inc.
Leeds & Northrup Co.
Research Appliance Co.
Sun Electric Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg. Div., Warren Brothers Roads Co.

Electrical

Accessory Controls & Equipment Corp.
Aero-Test Equipment Co., Inc.
*AEROTEST LABORATORIES, INC.
Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Research, Inc.
Associated Testing Labs., Inc.
Bendix Aviation Corp., Red Bank Div.
California Technical Industries, Div.-Textron Inc.
Consolidated Diesel Electric Corp., Test Equip. Div.
James Cunningham Son & Co., Inc.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Davenport Mfg. Co.
Dit-Mco, Inc., Electronics Div.
Edgerton, Germeshausen & Grier, Inc.
Electric Eye Equipment Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Gates Electronic Co.
General Electric Co., Apparatus Sales Div.
Greenbrier Instruments, Inc.
*GREER HYDRAULICS, INC.
Gremco, Inc.
Guardian Electric Mfg. Co.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Industrial Instruments Inc.
Instrument Laboratories
*KAHN & CO., INC.
Laboratory for Electronics, Inc.
Lane Electronics Mfg. Corp.
Leach Corp.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Multi-Amp Corp.
George L. Nankervis Co.
Opad Electric Co.
Optimized Devices, Inc.
*PACKARD-BELL ELECTRONICS CORP.
Peschel Electronics, Inc.
Phaostron Instrument & Electronic Co.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Rototest Labs., Inc.
Royal Industries, Inc.
Ryan Aeronautical Co.
Schaffer Air Industries, Inc.
Slaughter Co., Inc.
Strata Instrument Co.
Sun Electric Corp.
Stanley Aviation Corp.
Telectro Industries Corp.
United Mfg. Co. Div., The W. L. Maxson Corp.
Varo Mfg. Co.
Wacline, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Waveforms, Inc.
*WESTINGHOUSE ELECTRIC CORP.
Winder Aircraft Corp. of Fla.
Wright Equipment Corp.

Electronic

*AC SPARK PLUG DIV., GENERAL MOTORS CORP.
Advance Industries Inc.
Aero-Test Equipment Co., Inc.
*AEROTEST LABORATORIES, INC.
Aircraft Armaments, Inc.
Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
Amelco, Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Research, Inc.
Associated Testing Labs., Inc.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Ballantine Labs., Inc.
Bendix Aviation Corp., York Div.
Bliss Electronic Corp.
Boonton Electronics Corp.
Browning Laboratories, Inc.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
California Technical Industries, Div.-Textron Inc.
Canoga Corp. of California
Centronix Inc.
Cincinnati Sub Zero Products
Coleman Engrg. Co., Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
James Cunningham Son & Co., Inc.
Curtiss-Wright Corp., Electronics Div.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Davenport Mfg. Co.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Dynac, Inc.
Edgerton, Germeshausen & Grier, Inc.
Electric Eye Equipment Co.
Electronic Associates, Inc.
Electronics Corp. of America
Empire Products Sales Corp.
Epsco Inc.
Erie Resistor Corp.
Fenske Fedrick & Miller Co.
Flow Corp.
John Fluke Mfg. Co., Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
General Communication Co.
General Kinetics, Inc.
Georator Corp.
Goodyear Aircraft Corp.
*GREER HYDRAULICS, INC.
Guardian Electric Mfg. Co.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Heiland Div.—Minneapolis-Honeywell
I-L-S Instrument Corp.
International Research Associates
*KAHN & CO., INC.
Kay Electric Co.
Kearfott Co., Inc.
Laboratory for Electronics, Inc.
Lane Electronics Mfg. Corp.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
George L. Nankervis Co.
Non-Linear Systems Inc.
Opad Electric Co.
Optimized Devices, Inc.
Orbitran Co., Inc.
*PACKARD-BELL ELECTRONICS CORP.
Peschel Electronics, Inc.
Phaostron Instrument & Electronic Co.
Philadelphia Scientific Glass Co.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Precision Apparatus Co., Inc.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Resdel Engrg. Corp.
*RHEEM MFG. CO., ELECTRONICS DIV.
Rototest Labs., Inc.
Royal Industries, Inc.
Ryan Aeronautical Co.
Schaffer Air Industries, Inc.
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Specific Products
Strata Instrument Co.
Sun Electric Corp.
Stanley Aviation Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Systron Corp.
Technical Oil Tool Corp.
Technitrol Engrg. Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Telonic Industries, Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Thompson-Ramo-Wooldridge Products Co., The
Trio Laboratories, Inc.
Ultradyne, Inc.
Varo Mfg. Co.
Vectron, Inc.
Wacline, Inc.
Warren Mfg. Div., Warren Brothers Roads Co.
Waveforms, Inc.
Weinschel Engrg.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Western Electro-Acoustic Lab.
Winder Aircraft Corp. of Fla.
Wright Equipment Corp.

Environmental

Acton Laboratories Inc.
Aero-Test Equipment Co., Inc.
*AEROTEST LABORATORIES, INC.
Anchor Specialty Mfg. Co. Inc.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
Bendix Aviation Corp., York Div.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
CDC Control Services, Inc.
Cincinnati Sub Zero Products
*CONRAD, INC.
Consolidated Electrodynamics Corp., Rochester Div.
J. P. Devine Mfg. Co.
Electric Auto-Lite Co., The
Environmental Equipment Co.
Fischer & Porter Co.
G. W. Galloway Co.
Gardner Laboratory, Inc.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*GREER HYDRAULICS, INC.
Guardite Co., Div. of American-Marietta Co.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Haskell Engrg. & Supply Co.
Hicks Corp., The
Impact-O-Graph Corp., The
International Research Associates
Mantec Inc.
Missimers Inc.
Murphy & Miller Inc.
George L. Nankervis Co.
Rototest Labs., Inc.
Rucker Co., The
Ryan Aeronautical Co.
*RYAN INDUSTRIES
Standard Cabinet Co.
Sun Electric Corp.
Telectro Industries Corp.
Tenney Engrg., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg Div., Warren Brothers Roads Co.
Winder Aircraft Corp. of Fla.

Flight

*AEROTEST LABORATORIES, INC.
Associated Testing Labs., Inc.
Auto-Control Labs., Inc.
Bendix Aviation Corp., York Div.
Brush Instruments, Div.-Clevite Corp.
CDC Control Services, Inc.
California Technical Industries, Div.-Textron Inc.
Coleman Engrg. Co., Inc.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
J. W. Fecker, Inc., Sub.—American Optical Co.
Flow Corp.
*GREER HYDRAULICS, INC.
Guardite Co., Div. of American-Marietta Co.
Hallamore Electronics Co.
Heiland Div.—Minneapolis-Honeywell
Hicks Corp., The
Intercontinental Dynamics Corp.
International Radiant Corp.
Kearfott Co., Inc.
*WALLACE O. LEONARD, INC.
Mercury International Industries Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Minneapolis-Honeywell Regulator Co., Boston Div.
Republic Aviation Corp., Guided Missiles Div.
*RHEEM MFG. CO., ELECTRONICS DIV.
Rototest Labs., Inc.
Stanley Aviation Corp.
Task Corp.
Telectro Industries Corp.
Tenney Engrg., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Waugh Engrg. Co.

Humidity

Acton Laboratories, Inc.
Aerotest Laboratories, Inc.
Anchor Specialty Mfg. Co. Inc.
*ASSOCIATED TESTING LABS., INC.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
CDC Control Services, Inc.
Cincinnati Sub Zero Products
*CONRAD, INC.
Electron-Radar Products

Environmental Equipment Co.
Gardner Laboratory, Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Scientific Equipment Co.
Guardite Co., Div. of American-Marietta Co.
Hallamore Electronics Co.
Hicks Corp., The
E. Vernon Hill & Co.
International Radiant Corp.
***KAHN & CO., INC.**
Mantec Inc.
Missimers Inc.
Murphy & Miller Inc.
Rototest Labs., Inc.
Milton Roy Co.
***RYAN INDUSTRIES**
Scientific Instrument Co.
Standard Cabinet Co.
Telectro Industries Corp.
Tenney Engrg., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Universal Dynamics Corp.
Weighing & Control Components, Inc.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

Hypersonic

Associated Testing Labs., Inc.
CDC Control Services, Inc.
Coleman Engrg. Co., Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Rototest Labs., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Winder Aircraft Corp. of Fla.

Ignition

Aero-Test Equipment Co., Inc.
Allegany Instrument Co., Inc.
Anchor Specialty Mfg. Co. Inc.
Auburn Spark Plug Co., Inc.
Electric Auto-Lite Co., The
***GREER HYDRAULICS, INC.**
George L. Nankervis Co.
Research Appliance Co.
Schaffer Air Industries, Inc.
Scintilla Div., Bendix Aviation Corp.
Sun Electric Corp.
Tenney Engrg., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Winder Aircraft Corp. of Fla.

Impact

Acton Laboratories Inc.
***AEROTEST LABORATORIES, INC.**
Associated Testing Labs., Inc.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
CDC Control Services, Inc.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Heiland Div.—Minneapolis-Honeywell
Impact-O-Graph Corp., The
L. A. B. Corp.
Mantec Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Winder Aircraft Corp. of Fla.

Microwave

Airborne Instruments Lab., Inc.
Aircom Inc.
Aircraft Armaments, Inc.
American Electronic Labs., Inc.
Anchor Specialty Mfg. Co. Inc.
Bendix Aviation Corp., York Div.
Browning Laboratories, Inc.
California Technical Industries, Div.-Textron Inc.
Canoga Corp. of California
Chemalloy Electronics Corp.
Cubic Corp.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Dynac, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Empire Products Sales Corp.
Geisler Labs.
General Communication Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
McMillan Industrial Corp.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Northeast Electronics Corp.
Omega Labs., Inc.
Panoramic Radio Products, Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radar Design Corp.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Saratoga Industries
Technical Oil Tool Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Thieblot Aviation Co., Div.-Vitro Corp. of America
Vectron, Inc.
Wacline, Inc.
Waveline, Inc.
Wave Particle Corp.

Oxygen System

Aero-Test Equipment Co., Inc.
***AEROTEST LABORATORIES, INC.**
Air Products, Inc.
Amthor Testing Instrument Co., Inc.
Anchor Specialty Mfg. Co. Inc.
ARO Equipment Corp., The
CDC Control Services, Inc.
Minneapolis-Honeywell Regulator Co., Aeronautical Div.
Oxygen Equipment & Service Co.
Pioneer-Central Div., Bendix Aviation Corp.
Progressive Research & Development Co., Inc.
Schaffer Air Industries, Inc.
Stearns-Roger Mfg. Co.
Uniwave, Inc.
Winder Aircraft Corp. of Fla.

Pneumatic

Accessory Controls & Equipment Corp.
Aero-Test Equipment Co., Inc.
***AEROTEST LABORATORIES, INC.**
***AMERICAN MACHINE & FOUNDRY CO.**
Anchor Specialty Mfg. Co. Inc.
Auto-Control Labs., Inc.
CDC Control Services, Inc.
Cardox Corp.
Consolidated Diesel Electric Corp., Test Equip. Div.
***COOPER DEVELOPMENT CORP.**
***CORNELIUS CO., THE**
Fischer & Porter Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenbrier Instruments Inc.
***GREER HYDRAULICS, INC.**
Haskell Engrg. & Supply Co.
***KAHN & CO., INC.**
Walter Kidde & Co., Inc., Aviation Div.
***WALLACE O. LEONARD, INC.**
Progressive Research & Development Co., Inc.
Rucker Co., The
Schaffer Air Industries, Inc.
Scientific Instrument Co.
Sprague Engrg. Corp.
Sun Electric Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
United Mfg. Co. Div., The W. L. Maxson Corp.
Wells Industries Corp.
Winder Aircraft Corp. of Fla.

Temperature

Accessory Controls & Equipment Corp.
Acton Laboratories Inc.
Advanced Electronics, Inc.
Aero-Test Equipment Co., Inc.
***AEROTEST LABORATORIES, INC.**
Anchor Specialty Mfg. Co. Inc.
Arnoux Corp.
Associated Testing Labs., Inc.
Avien, Inc.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
Brush Instruments, Div.-Clevite Corp.
CDC Control Services, Inc.
Cardinal Instrumentation Corp.
Cincinnati Sub Zero Products
***CONRAD, INC.**
Consolidated Diesel Electric Corp., Test Equip. Div.
Environmental Equipment Co.
Fischer & Porter Co.
Flow Corp.
G. W. Galloway Co.
Gardner Laboratory, Inc.
Gray Instrument Co.
Greenbrier Instruments Inc.
***GREER HYDRAULICS, INC.**
Guardite Co., Div. of American-Marietta Co.
Hagan Chemicals & Controls, Inc.
Hallikainen Instruments
Harco Labs., Inc.
Heiland Div.-Minneapolis-Honeywell
E. Vernon Hill & Co.
Illinois Testing Laboratories, Inc.
International Radiant Corp.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Mantec Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Murphy & Miller Inc.
Palmer Thermometers, Inc.
Patterson, Moos Div.-Universal Winding Co., Inc.
Research, Inc.
Rototest Labs., Inc.
***RYAN INDUSTRIES**
Schaffer Air Industries, Inc.
Scientific Instrument Co.
Standard Cabinet Co.
Sun Electric Corp.
Tenney Engrg., Inc.
Thermo Electric Co., Inc.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Victory Engineering Corp.
Warren Mfg. Div., Warren Brothers Roads Co.
***WESTINGHOUSE ELECTRIC CORP.**
Winder Aircraft Corp. of Fla.

Vibration

Acton Laboratories Inc.
***AEROTEST LABORATORIES, INC.**
All American Tool & Mfg. Co.
Anchor Specialty Mfg. Co. Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Brush Instruments, Div.-Clevite Corp.
CDC Control Services, Inc.
Calidyne Co., Inc., The
Columbia Research Labs.
***CONRAD, INC.**
Consolidated Electrodynamics Corp.
Endevco Corp.
Environmental Equipment Co.
Epic, Inc.
G. W. Galloway Co.
Georator Corp.
Heiland Div.—Minneapolis-Honeywell
Impact-O-Graph Corp., The
International Research Associates
***KAHN & CO., INC.**
Kay Electric Corp.
L. A. B. Corp.
MB Mfg. Co.
Mantec Inc.
Panoramic Radio Products, Inc.
Rototest Labs., Inc.
Royal Industries, Inc.
Southwestern Industrial Electronics Co.
Task Corp.
Tel-Instrument Electronics Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Warren Mfg. Div., Warren Brothers Roads Co.
Western Electro-Acoustic Lab.
***WESTINGHOUSE ELECTRIC CORP.**
Winder Aircraft Corp. of Fla.

TEST LEADS

Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
American Super-Temperature Wires, Inc.
Associated Research, Inc.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
Electro-Tech Equipment Co.
First Electronics Corp., The
General Cable Corp.
Hallett Mfg. Co.
Hammett Electric Co.
Hi-Lo Manufacturing Corp.
International Electric Industries, Inc.
Keystone Electronics Corp.
Phaostron Instrument & Electronic Co.
Pomona Electronics Co., Inc.
Precision Apparatus Co., Inc.
Schaffer Air Industries, Inc.
Simpson Electric Co.
Sittler Corp.
Skytronics
Slaughter Co., Inc.
Sun Electric Corp.
Telectro Industries Corp.
Tricraft Products Corp.
Western International Co.

TEST STANDS, STATIC

Aircraft Standards, Inc.
Arnolt Corp.
Auto-Control Labs., Inc.
Ballymore Co.
Calcor Corp., Aircraft Div.
Champion Airquipment Inc.
Champion Co., The
C. B. Christiansen Co.
Consolidated Diesel Electric Corp., Test Equip. Div.
***COOPER DEVELOPMENT CORP.**
***CORNELIUS CO., THE**
Denison Engrg. Div., American Brake Shoe Co.
***DIVERSEY ENGRG. CO.**
Dynametrics Corp.
G. W. Galloway Co.
General Sound Control, Inc.
Hicks Corp., The
***KAHN & CO., INC.**
Kaiser Steel Corp., Fabricating Div.
Loewy-Hydropress, Div.—Baldwin-Lima-Hamilton
Luria Engrg. Co.
R. C. Mahon Co., The
Mantec, Inc.
McDowell Co. Inc.
George L. Nankervis Co.
***PACKARD-BELL ELECTRONICS CORP.**
Performance Measurements Co.
Philips & Davies Inc.

[illegible] Aviation Corp., Guided Missiles Div.
Royal Industries, Inc.
Rucker Co., The
Shaw Metal Products Corp.
Swedlow Plastics Co.
Thompson-Ramo-Wooldridge Products Co., The
United Mfg. Co., The
***Washington Aluminum Co., Inc.**
Washington Technological Associates Inc.

TEST UNITS, ACCELERATION, MILITARY

Aircraft Standards, Inc.
Associated Testing Labs., Inc.
Columbia Research Labs.
Consolidated Electrodynamics Corp., Rochester Div.
***KAHN & CO., INC.**
Luria Engrg. Co.
Pioneer-Central Div., Bendix Aviation Corp.
Rucker Co., The
Stromberg-Carlson, Electronics Div.
Warren Mfg. Div., Warren Brothers Roads Co.
Washington Technological Associates Inc.

TESTERS

Allegany Instrument Co., Inc.
Associated Research, Inc.
Barnes Development Co.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Bright Star Industries
Consolidated Avionics Corp.
Davenport Mfg. Co.
Dit-Mco, Inc., Electronics Div.
Electric Auto-Lite Co., The
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
National Pneumatic Co., Inc.
Precision Apparatus Co., Inc.
Reeves Instrument Corp.
Royal Industries, Inc.
Simpson Electric Co.
Sonex, Inc.
Wacline, Inc.

Amplitude Linearity

Barnes Development Co.

Automatic Tube

Anchor Specialty Mfg. Co. Inc.
Gates Electronic Co.
Hickok Electrical Instrument Co., The
Resdel Engrg. Corp.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Seco Mfg. Co.

Battery

Anchor Specialty Mfg. Co. Inc.
Bogue Electric Mfg., Co.
Christie Electric Corp.
Electric Auto-Lite Co., The
***EXIDE INDUSTRIAL DIV.-THE ELECTRIC STORAGE BATTERY CO.**
Gates Electronic Co.
General Scientific Equipment Co.
Green Rectifier Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Imperial Brass Mfg. Co., The
Industrial Control Co.
Precise Development Corp.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Sun Electric Corp.
Telectro Industries Corp.

Cable

Amatom Electronic Hardware Co. Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Research, Inc.
Barnes Development Co.
Bliss Electronic Corp.
California Technical Industries ,Div.-Textron Inc.
Dit-Mco, Inc., Electronics Div.
Electric Auto-Lite Co., The
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Guardian Electric Mfg. Co.
Industrial Instruments Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Multi-Amp Corp.
Radar Engineers
Schaffer Air Industries, Inc.
Telectro Industries Corp.

Capacitor

Associated Research, Inc.
Barnes Development Co.
Boonton Electronics Corp.
Electric Auto-Lite Co., The
Industrial Control Co.
Gerard G. Leeds Co., Inc.
Liquidometer Corp., The
Precision Apparatus Co., Inc.
Telectro Industries Corp.

Cathode Ray Tube

Hickok Electric Instrument Co., The
Hi-Lo Manufacturing Corp.
Precise Development Corp.
Precision Apparatus Co., Inc.
Skiatron Electronics & Television Corp.
Sun Electric Corp.
Tricraft Products Corp.

Circuit

Allegany Instrument Co., Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Research, Inc.
Bendix Aviation Corp., York Div.
Bliss Electronic Corp.
Bogue Electric Mfg., Co.
California Technical Industries, Div.-Textron Inc.
Dit-Mco, Inc., Electronics Div.
Fenske Fedrick & Miller Co.
Guardian Electric Mfg. Co.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Ideal Industries, Inc.
Industrial Control Co.
Lavoie Labs., Inc.
Peschel Electronics, Inc.
Precision Apparatus Co., Inc.
Royal Industries, Inc.
Schaffer Air Industries, Inc.
Seco Mfg. Co.
Sittler Corp.
Sun Electric Corp.

Coating Thickness

Gardner Laboratory, Inc.
***KAHN & CO., INC.**
Unit Process Assemblies, Inc.

Coil

Barnes Development Co.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Seco Mfg. Co.
Sun Electric Corp.

Color Infra Red

Baird Atomic, Inc.
***COOPER DEVELOPMENT CORP.**
Haller Raymond & Brown Inc.
Skiatron Electronics & Television Corp.

Continuity

Amelco, Inc.
Anchor Specialty Mfg. Co. Inc.
Associated Research, Inc.
James G. Biddle Co.
Bliss Electronic Corp.
Bright Star Industries
California Technical Industries, Div.-Textron Inc.
Davenport Mfg. Co.
Dit-Mco, Inc., Electronics Div.
Guardian Electric Mfg. Co.
Ideal Industries, Inc.
Multi-Amp Corp.
Peschel Electronics Inc.
Royal Industries, Inc.
Schaffer Air Industries, Inc.
Seco Mfg. Co.
Sittler Corp.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Telectro Industries Corp.

Crystal Testing

Airborne Instruments Lab., Inc.
Barnes Development Co.
August E. Miller Laboratories
Reeves Instrument Corp.
Systron Corp.

Diode

Airborne Instruments Lab., Inc.
Barnes Development Co.
Hickok Electrical Instrument Co., The
Multi-Amp Corp.
Sonex, Inc.
Stromberg Carlson, Electronics Div.
Technitrol Engrg. Co.

Distortion

Boonton Electronics Corp.
Empire Products Sales Corp.
Telectro Industries Corp.

Induction

Anchor Specialty Mfg. Co. Inc.
Gerard G. Leeds Co., Inc.
Telectro Industries Corp.

Insulation

Anchor Specialty Mfg. Co. Inc.
Associated Research, Inc.
Bendix Aviation Corp., Red Bank Div.
James G. Biddle Co.
California Technical Industries, Div.-Textron Inc
Davenport Mfg. Co.
Dit-Mco, Inc., Electronics Div.
Electro-Tech Equipment Co.
Food Machinery & Chemical Corp., Ordnance Div.
Industrial Instruments Inc.
Janco Corp.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Multi-Amp Corp.
Opad Electric Co.
Peschel Electronics, Inc.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Strata Instrument Co.

Insulation Breakdown

Associated Research, Inc.
Barnes Development Co.
Bendix Aviation Corp., Red Bank Div.
Bliss Electronic Corp.
California Technical Industries, Div.-Textron Inc.
Davenport Mfg. Co.
Dit-Mco, Inc., Electronics Div.
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Guardian Electric Mfg. Co.
Industrial Instruments Inc.
Kearfott Co., Inc.
Gerard G. Leeds Co., Inc.
Multi-Amp Corp.
National Pneumatic Co., Inc.
Opad Electric Co.
Peschel Electronics, Inc.
Saratoga Industries
Schaffer Air Industries, Inc.
Slaughter Co., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Meter

Associated Research, Inc.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Roflan Co., The
Saratoga Industries
Simpson Electric Co.

Microwave

California Technical Industries, Div.-Textron Inc.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Demornay-Bonardi
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Gerard G. Leeds Co., Inc.
Telechrome Mfg. Corp.
***TELERAD MFG. CORP.**
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Theodolites

***HAYWARD SCIENTIFIC GLASS CORP.**

THERMOMETERS, RESISTANCE

Arnoux Corp.
Cardinal Instrumentation Corp.
Consolidated Controls Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
Flow Corp.
General Electric Co., Apparatus Sales Div.
Illinois Testing Laboratories, Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Liquidometer Corp., The
Minco Products, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Rosemount Engrg. Co.
Simpson Electric Co.
Thermo Electric Co., Inc.
Trans-Sonics, Inc.
United Control Corp.

THERMOPILES

Aero Research Instrument Co. Inc.
Cambridge Instrument Company, Inc.
Electro Impulse Lab., Inc.
Illinois Testing Laboratories, Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust Div.
Pyrometer Instrument Co., Inc.
Simpson Electric Co.

THERMOSTATS

Barber-Colman Co.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Fenwal Inc.
G-V Controls Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Metals & Controls Corp.
George Ulanet Co.
Powers Regulator Co., The
***STEVENS MFG. CO., INC.**
United Control Corp.
Vap-Air Div., Vapor Heating Corp.

THICKNESS EQUIPMENT

Cleveland Instrument Co.
Consolidated Avionics Corp.
Curtiss-Wright Corp., Electronics Div.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Gardner Laboratory, Inc.
General Electric Co., Apparatus Sales Div.
Optomechanisms Inc.
Size Control Co.
Unit Process Assemblies, Inc.

THRUST MEASURING INSTRUMENTS

Allegany Instrument Co., Inc.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Columbia Research Labs.
Consolidated Controls Corp.
Dynametrics Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photocon Research Products
Thieblot Aviation Co., Div.-Vitro Corp. of America

TOOLS, ALIGNMENT

Air Logistics Corp.
Amatom Electronic Hardware Co. Inc.
***BAUSCH & LOMB OPTICAL CO.**
Bergen Carbide Co.
J. W. Fecker, Inc., Sub.—American Optical Co.
G. W. Galloway Co.
General Railway Signal Co.
Kellett Aircraft Corp.
Keystone Electronics Corp.
Republic Aviation Corp., Guided Missiles Div.
Stevens Walden Inc.

TOOLS, HAND OR MECHANICAL

Air Speed Tool Co.
Amatom Electronic Hardware Co. Inc.
Bergen Carbide Co.
***BILLINGS & SPENCER CO., THE**
Capewell Mfg. Co.
Eyelet Tool Co. Inc.
Ideal-Aerosmith, Inc.
Ideal Industries, Inc.
Metallurgical Products Dept., General Electric Co.
Overload Control Co.
H. K. Porter Inc.
Progressive Research & Development Co., Inc.
Stevens Walden Inc.
Strata Instrument Co.
P. A. Sturtevant Co.
Twix Mfg. Co., Inc.

TRANSDUCERS

Aeronca Mfg. Corp.
Allegany Instrument Co., Inc.
American Electronics, Inc.
Arnoux Corp.
Atlantic Research Corp.
BJ Electronics, Borg-Warner Corp.
Chesapeake Instrument Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Fairchild Controls Corp., Components Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Haller Raymond & Brown Inc.
***WALLACE O. LEONARD, INC.**
Minatron Corp.
Roflan Co., The
Servonic Instruments, Inc.
Southwestern Industrial Electronics Co.
Ultradyne, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
Waugh Engrg. Co.

Flow

Acoustica Associates, Inc.
Brooks Rotameter Co.
Crescent Engrg. & Research Co.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Flow Corp.
Gilmore Industries Inc.
Hagan Chemicals & Controls, Inc.
***WALLACE O. LEONARD, INC.**
George L. Nankervis Co.
Potter Aeronautical Corp.
Southwestern Industrial Electronics Co.
Trans-Sonics, Inc.
Ultradyne, Inc.
Waugh Engrg. Co.

Industrial

Acoustica Associates, Inc.
Baird-Atomic, Inc.
Cleveland Instrument Co.
Crescent Engrg. & Research Co.
Daytronic Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Electro Products Labs., Inc.
Haller Raymond & Brown Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
George L Nankervis Co.
Narda Ultrasonics Corp., The
Servonic Instruments, Inc.
Southwestern Industrial Electronics Co.
Ultradyne, Inc.

Measurement

Acoustica Associates, Inc.
Aeronca Mfg. Corp.
Chesapeake Instrument Corp.
Cleveland Instrument Co.
G. L. Collins Corp.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Daytronic Corp.
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Edcliff Instruments
Electro Products Labs., Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Haller Raymond & Brown Inc.
***WALLACE O. LEONARD, INC.**
Minneapolis-Honeywell Regulator Co., Boston Div.
Roflan Co., The
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Ultradyne, Inc.

Pressure

ARO Equipment Corp., The
Atlantic Research Corp.
BJ Electronics, Borg-Warner Corp.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Computer Instruments Corp.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Datran Electronics, Div.—Mid-Continent Mfg., Inc.
Daytronic Corp.
Henry G. Dietz Co., Inc., The
Dynametrics Corp.
Dynamic Instrument Co., Inc.
Edcliff Instruments
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Endevco Corp.
Fairchild Controls Corp., Components Div.
Fischer & Porter Co.
Friez Instrument Div.-Bendix Aviation Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gilmore Industries Inc.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Gulton Industries, Inc.
Hagan Chemicals & Controls, Inc.
Haller Raymond & Brown Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
***WALLACE O. LEONARD, INC.**
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photocon Research Products
Roflan Co., The
Servonic Instruments, Inc.
Task Corp.
Trans-Sonics, Inc.
Ultradyne, Inc.
United Control Corp.
U. S. Gauge Div.,-American Machine & Metals, Inc.
Vap-Air Div., Vapor Heating Corp.

Sonar

Acoustica Associates, Inc.
Atlantic Research Corp.
Chesapeake Instrument Corp.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Gulton Industries, Inc.
Haller Raymond & Brown Inc.
Massa Labs., Inc.
Southwestern Industrial Electronics Co.

Strain

Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Centronix Inc.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Daytronic Corp.
Dynamic Instrument Co., Inc.
Gilmore Industries Inc.
Gulton Industries, Inc.
Southwestern Industrial Electronics Co.
Task Corp.

Temperature

Allegany Instrument Co., Inc.
Arnoux Corp.
Atlantic Instrument Corp., Sub.-American Electronics, Inc.
Cardinal Instrumentation Corp.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electronic Processes Corp. of California
Fenwal Inc.
Flow Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gilmore Industries Inc.
Hagan Chemicals & Controls, Inc.
Haller Raymond & Brown Inc.
Leeds & Northrup Co.
Lewis Engrg. Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Rosemount Engrg. Co.
Thermo Electric Co., Inc.
Trans-Sonics, Inc.
United Control Corp.
Vap-Air Div., Vapor Heating Corp.
Victory Engineering Corp.

Vibration

Atlantic Research Corp.
Calidyne Co., Inc., The
Chesapeake Instrument Corp.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Edcliff Instruments
Electro Products Labs., Inc.
Endevco Corp.
Gilmore Industries Inc.
Gulton Industries, Inc.
Gerard C. Leeds Co., Inc.
MB Mfg. Co.
Massa Labs., Inc.
Southwestern Industrial Electronics Co.

TRANSFORMER WINDINGS

A. P. W. Co.
Advance Industries, Inc.
Advanced Electronics, Inc.
Central Coil Co. Inc.
Central Transformer Co.
Electrical Windings, Inc.
Electro Engrg. Works
Ferranti Electric Inc.
General Railway Signal Co.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Highland Engrg. Co.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
National Coil Co.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Quick Charge Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Saratoga Industries
Sioux Radio Products
Southwestern Industrial Electronics Co.
Transonic, Inc.
Tresco, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
Wright Zimmerman, Inc.

TRANSCEIVERS

Adler Electronics, Inc.
Amelco, Inc.
American Electronics, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Munston Mfg. & Service, Inc.
National Electronics Laboratories, Inc.
Production Research Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Terminal Radio Corp.

. . . test equipment

Portable

Amelco, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Haller Raymond & Brown Inc.
International Research Associates
Munston Mfg. & Service, Inc.
Production Research Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Terminal Radio Corp.

Uhf

Adler Electronics, Inc.
Amelco, Inc.
Haller Raymond & Brown Inc.
Magnavox Co., The
***SEEBURG CORP., THE**
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Terminal Radio Corp.

Vhf

Adler Electronics, Inc.
Amelco, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Haller Raymond & Brown Inc.
National Electronics Laboratories, Inc.
Production Research Corp.
***SEEBURG CORP., THE**
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Terminal Radio Corp.
Varo Mfg. Co.

TRANSDUCERS, ACCELEROMETER

American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
BJ Electronics, Borg-Warner Corp.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Ecs Corp.
Edcliff Instruments
Endevco Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gates Electronic Co.
Gulton Industries, Inc.
***WALLACE O. LEONARD, INC.**
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Terminal Radio Corp.
Ultradyne, Inc.
Vap-Air Div., Vapor Heating Corp.

TRANSFORMERS

Acme Electric Corp.
Advance Industries, Inc.
Aladdin Electronics, Div.-Aladdin Industries Inc.
Alto Scientific Co., Inc.
Bogue Electric Mfg., Co.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Eisler Engrg. Co., Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ferranti Electric Inc.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Lavoie Labs., Inc.
Magnetico, Inc.
Mara Electronics, Inc.
Microtran Co. Inc.
Munston Mfg. & Service Inc.
Nyt Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Standard Transformer Co.
Sterling Transformer Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transonic, Inc.
Tresco, Inc.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Output

Acme Electric Corp.
Acro Products Co.
Advance Industries, Inc.
Bogue Electric Mfg., Co.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Cycle Transformer Corp.
Ecs Corp.
Electrical Windings, Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Ferranti Electric Inc.
Georator Corp.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Hindle Transformer Co. Inc.
Lavoie Labs., Inc.
Magnetico, Inc.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
Nyt Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Standard Transformer Co.
Sterling Transformer Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Power

Acme Electric Corp.
Advance Industries, Inc.
Bogue Electric Mfg., Co.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Eisler Engrg. Co., Inc.
Electrical Windings, Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Ferranti Electric Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Hindle Transformer Co. Inc.
Lavoie Labs., Inc.
Magnetico, Inc.
Mara Electronics, Inc.
Microtran Co., Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Tranformer Co., Inc.
Osborne Electronic Sales Corp.
Ram Electronics, Inc.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Standard Transformer Co.
Sterling Transformer Corp.
Superior Electronic Co., The
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Precision Voltage Dividing

Acromag, Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Coil Co. of America
Cycle Transformer Corp.
ECS Corp.
Ferranti Electric Inc.
Gertsch Products Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Magnetico, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

Pulse

Acme Electric Corp.
Advance Industries, Inc.
Aladdin Electronics, Div.-Aladdin Industries Inc.
Alto Scientific Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Digitronics Corp.
ECS Corp.
Electronic Transformer Co., Inc.
Epsco Inc.
Fugle-Miller Labs. Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Lavoie Labs., Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
New York Transformer Co. Inc.
Orbitran Co., Inc.
Osborne Electronic Sales Corp.
Ram Electronics Inc.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
United Transformer Corp.
Varo Mfg. Co
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.
Wright Zimmerman, Inc.

R-F and I-F

Advance Industries, Inc.
Aladdin Electronics, Div.-Aladdin Industries Inc.
Carad Corp.
Fugle-Miller Labs. Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div-Southwestern Industrial Electronics
J-V-M Microwave Co.
Lenkurt Electric Co., Inc.
J. W. Miller Co.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc
National Coil Co.
New York Coil Co., Inc.
North Hills Electric Co., Inc.
Osborne Electric Sales Corp.
Radio Industries, Inc.
Ram Electronics Inc.
Ryan Aeronautical Co.
Sioux Radio Products
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

Ultrasonic

Acoustica Assocites, Inc.
Celco-Constantine Engrg. Laboratories Co.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Electronic Transformer Co., Inc.
Ferranti Electric Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
Narda Ultrasonics Corp., The
New York Transformer Co., Inc.
North Hills Electric Co., Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Southewestern Industrial Electronics Co.
Sterling Transformer Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.

TRANSISTOR ANALYZERS

American Electronics, Inc.
Baird-Atomic, Inc.
Barnes Development Co.
Consolidated Avionics Corp.
Cubic Corp.
James Cunningham Son & Co., Inc.
Haller Raymond & Brown Inc.
Kay Electric Co.
Owen Labs., Inc.
Precision Apparatus Co., Inc.
Ryan Aeronatuical Co.
Sonex, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Trans Electronics, Inc.
Transvision, Inc.
Ultradyne, Inc.

TRANSISTORS

Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Clevite Transistor Products, Div.-Clevite Corp.
Haller Raymond & Brown Inc.
R. I. Metpro, Inc.
Motorola Semiconductor Products Div.
Philco Corp., Government & Industrial Divs.
Stromberg-Carlson, Electronics Div.
Terminal Radio Corp.

TUBE

Enflo Corp.
Roll Formed Products Co.
Sylvania Electric Products Inc., Parts Div.
Terminal Radio Corp.

Cooling Units

Beaton & Corbin Mfg. Co., The
Dunham-Bush Inc.
***EASTERN INDUSTRIES, INC.**
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Cable Corp.
Terminal Radio Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**

Pin Straighteners

Hickok Electrical Instrument Co., The
Star Expansion Products
Terminal Radio Corp.

Pullers

Terminal Radio Corp.

Seal Leads

Sylvania Electric Products Inc., Parts Div.
Terminal Radio Corp.

Shields

Atlas E-E Corp.
Beaton & Corbin Mfg. Co., The
H. Braun Tool & Instrument Co., Inc.
Connector Corp.
Continental-Diamond Fibre Corp. Sub.—The Budd Co.
Elco Corp.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
E. F. Johnson Co.
Paul & Beekman, Inc.
Sylvania Electric Products Inc., Parts Div.
Terminal Radio Corp.
Vector Electronic Co.

Sockets

Alden Products Co.
Connector Corp.
Elco Corp.
Enflo Corp.
E. F. Johnson Co.
Mycalex Corp. of America
Sylvania Electric Products, Inc., Parts Div.
Terminal Radio Corp.
Vector Electronic Co.
Waldom Electronics, Inc.

TUBE PARTS

Beaton & Corbin Mfg. Co., The
Champion Airquipment, Inc.
Diamonite Products Mfg. Co.
Gasket, Packing & Specialty Co., Inc.
Hamilton Watch Co., Military Products Div.
R. I. Metpro, Inc.
Roll Formed Products, Inc., Parts Div.
Terminal Radio Corp.

TUBES

Burroughs Corp.
Central Electronic Mfgrs., Inc.
Continental-Diamond Fibre Corp., Sub.—The Budd Co.
Haller Raymond & Brown, Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United Electronics Co.

atr

Bomac Laboratories, Inc.
Central Electronic Mfgrs., Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Backward Wave

Demornay-Bonardi
Geisler Labs.
Nuclear Corp. of America, Inc.
Polarad Electronics Corp.
Terminal Radio Corp.
Wunderlich Radio Co.

Ballast

Gates Electronic Co.
Philco Corp., Lansdale Tube Co., Div.
Terminal Radio Corp.

Battery Charger

Christie Electric Corp.
General Electric Co., Apparatus Sales Div.
General Scientific Equipment Co.
Gordos Corp.
Hammett Electric Co.
Terminal Radio Corp.

Bolometer

Microwave Electronics Div., Sperry Gyroscope Co.
Terminal Radio Corp.

Cathode Ray, Instrument Use

Edgerton, Germeshausen & Grier, Inc.
Ferranti Electric, Inc.
National Union Electric Corp.
Philco Corp., Lansdale Tube Co., Div.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.
Vacuum Tube Products Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Cathode Ray, Multiple Gun

Skiatron Electronics & Television Corp.
Terminal Radio Corp.
Vacuum Tube Products Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Ceramic

American Lava Corp.
Bendix Aviation Corp., Red Bank Div.
Edgerton, Germeshausen & Grier, Inc.
Electrical Refractories Co., The
Ferranti Electric, Inc.
Isolantite Mfg. Corp.
Terminal Radio Corp.
United Electronics Co.

Computer, Storage

National Union Electric Corp.
Terminal Radio Corp.
Wunderlich Radio Co.

Counter Beam

Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Terminal Radio Corp.

Electrometer

Ferranti Electric, Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Electron Multiplier

National Union Electric Corp.
Terminal Radio Corp.

Gamma Ray, Nuclear

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Geiger Counter, Nuclear

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.
Wunderlich Radio Co.

Geiger Mueller

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Instruments Div.—Philips Electronics, Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Glow or Discharge

Amglo Corp.
***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Burroughs Corp., Electronic Tube Div.
Edgerton, Germeshausen & Grier, Inc.
Ferranti Electric, Inc.
Gordos Corp.
Kemlite Laboratories, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
Veeco Vacuum Corp.

Ignitron

Beaton & Corbin Mfg. Co., The
Hammett Electric Co.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Infrared

Central Electronic Mfgrs., Inc.
Electronics Corp. of America
Haller Raymond & Brown, Inc.
Infrared Industries, Inc.
Kemlite Laboratories, Inc.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Ionization

General Electronic Mfgrs., Inc.
NRC Equipment Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
Vacuum Tube Products Co., Inc.
Veeco Vacuum Corp.

Klystron

Bendix Aviation Corp., Red Bank Div.
Bomac Laboratories, Inc.
Demornay-Bonardi
Ferranti Electric, Inc.
Geisler Labs.
Georator Corp.
Hammett Electric Co.
Polarad Electronics Corp.
Ryan Aeronautical Co.
Terminal Radio Corp.

Magnetron

Bomac Laboratories, Inc.
Demornay-Bonardi
Ferranti Electric, Inc.
Geisler Labs.
Polarad Electronics Corp.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Miniature

National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Noise Source

Bendix Aviation Corp., Red Bank Div.
Bomac Laboratories, Inc.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Central Electronics Mfrs., Inc.
Demornay-Bonardi
Ferranti Electric, Inc.
Geisler Labs.
Nuclear Corp. of America, Inc.

. . . test equipment

Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Phototubes

Central Electronics Mfrs., Inc.
Edgerton, Germeshausen & Grier, Inc.
Electron Radar Products
Electronics Corp. of America
General Electric Co., Apparatus Sales Div.
Gordos Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Phototubes, Mutiplier

Jarrell-Ash Co.
Terminal Radio Corp.

Pirani

NRC Equipment Corp.
Terminal Radio Corp.
Vacuum Tube Products Co., Inc.
Veeco Vacuum Corp.

Power Amplifier

Bendix Aviation Corp., Red Bank Div.
Central Electronics Mfrs., Inc.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
***WESTINGHOUSE ELECTRIC CORP.**

Projection

***BAUSCH & LOMB OPTICAL CO.**
National Union Electric Corp.
Terminal Radio Corp.

Receiving

Bendix Aviation Corp., Red Bank Div.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Rectifying

Bendix Aviation Corp., Red Bank Div.
Central Electronics Mfrs., Inc.
Edgerton, Germeshausen & Grier, Inc.
Gates Electronic Co.
Gordos Corp.
Hammett Electric Co.
Instruments Div.—Philips Electronics, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Scintillation

Baird-Atomic, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Sparkgap

Bendix Aviation Corp., Red Bank Div.
Edgerton, Germeshausen & Grier, Inc.
Kemlite Laboratories, Inc.
Terminal Radio Corp.

Strobe

Amglo Corp.
Edgerton, Germeshausen & Grier, Inc.
Kemlite Laboratories, Inc.
Terminal Radio Corp.

Subminiature

Bendix Aviation Corp., Red Bank Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Switching

Bendix Aviation Corp., Red Bank Div.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Central Electronics Mfrs., Inc.
Ebert Electronics Corp.
Edgerton, Germeshausen & Grier, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
Vacuum Tube Products Co., Inc.

Thyratron

Edgerton, Germeshausen & Grier, Inc.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co., Inc.

tr

Bomac Laboratories, Inc.
Central Electronics Mfrs., Inc.
Ferranti Electric, Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Transducer

Terminal Radio Corp.

Transmitting

Central Electronics Mfrs., Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Ryan Aeronautical Co.
Terminal Radio Corp.
United Electronics Co.
***WESTINGHOUSE ELECTRIC CORP.**

Transmitting-Receiving

Central Electronics Mfrs., Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United Electronics Co.

Ultra-Violet

Baird-Atomic, Inc.
Gordos Corp.
Kemlite Laboratories, Inc.
Menlo Research Lab.
Terminal Radio Corp.
Ultra-Violet Products, Inc.

Vacuum

Bendix Aviation Corp., Red Bank Div.
Burroughs Corp., Electronic Tube Div.
Central Electronics Mfrs., Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Voltage Reference or Regulating

***ANTON ELECTRONIC LABS., INC.**
Bendix Aviation Corp., Red Bank Div.
R. C. Dudek & Co.
John Fluke Mfg. Co., Inc.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Superior Electric Co., The
Terminal Radio Corp.

X-Ray

Bracke-Seib X-Ray Co., Inc.
Ferranti Electric, Inc.
Hammett Electric Co.
Instruments Div.—Philips Electronics Inc.
St. John X-Ray Laboratory
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

TUNERS

Amelco, Inc.
Bogart Mfg. Corp.
Browning Laboratories, Inc.
Electronic Communications, Inc.
P. R. Mallory & Co., Inc.
Technical Oil Tool Corp.
Terminal Radio Corp.

a-m

Amelco, Inc.
Browning Laboratories Inc.
Polarad Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Automatic

Amelco, Inc.
Browning Laboratories Inc.
Electronic Communications, Inc.
P. R. Mallory & Co., Inc.
Polarad Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.

f-m

Amelco, Inc.
Browning Laboratories, Inc.
P. R. Mallory & Co., Inc.
Polarad Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Klystron

Aircom, Inc.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Empire Products Sales Corp.
Polarad Electronics Corp.
Ryan Aeronautical Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.

Microwave

Aircom, Inc.
Airtron, Inc.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
***DALMO VICTOR CO., DIV.—TEXTRON, INC.**
Demornay-Bonardi
Douglas Microwave Co., Inc.
Electronic Communications, Inc.
Empire Products Sales Corp.
John Gombos Co., Inc.
J-V-M Microwave Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Polarad Electronics Corp.
Radar Design Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Uniwave, Inc.
Vectron, Inc.
Waveline, Inc.

Permeability

J-V-M Microwave Co.
Telectro Industries Corp.
Terminal Radio Corp.

Tuning Units, Antenna

Amelco, Inc.
***DALMO VICTOR CO., DIV.—TEXTRON, INC.**
Empire Products Sales Corp.
Telectro Industries Corp.
Terminal Radio Corp.

uhf

Aircom, Inc.
Amelco, Inc.
Electronic Communications Inc.
Empire Products Sales Corp.
J-V-M Microwave Co.
P. R. Mallory & Co., Inc.
Narda Microwave Corp., The
Polarad Electronics Corp.
Radar Design Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.

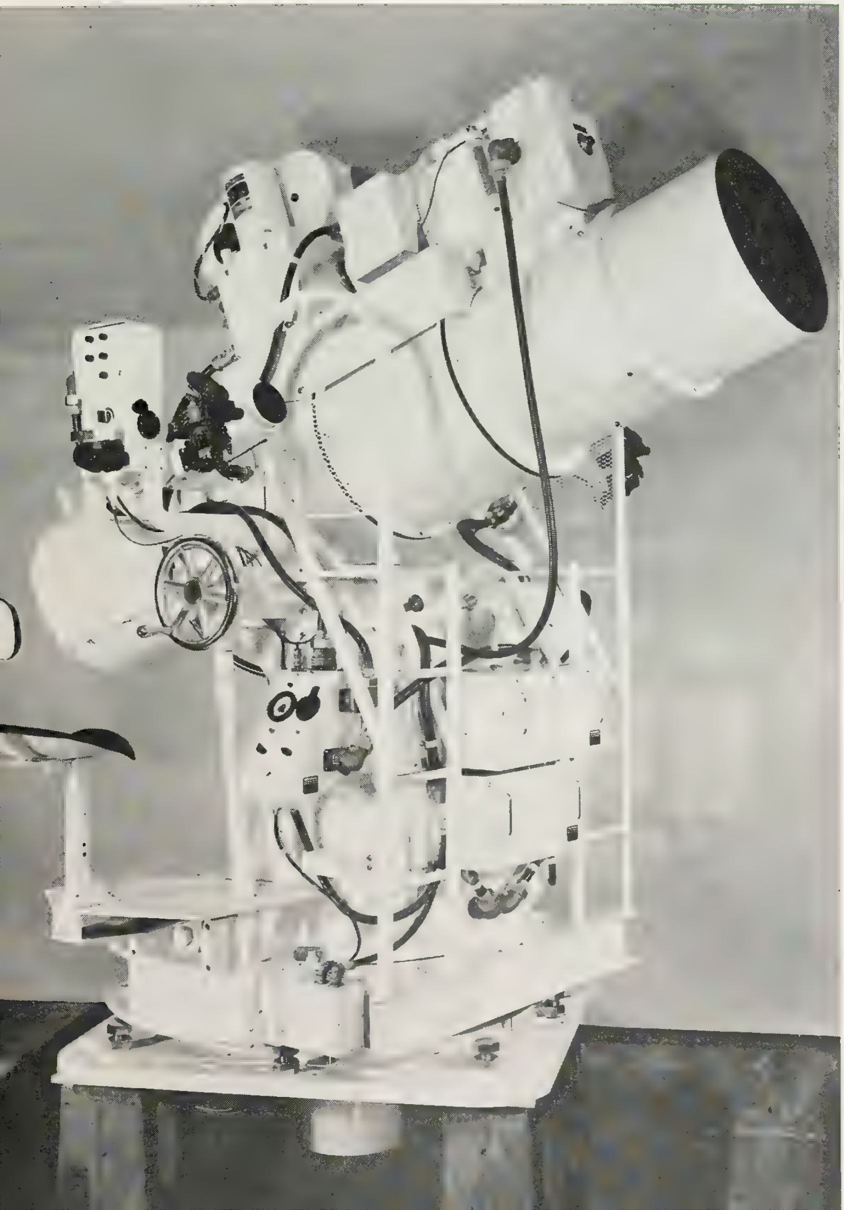
ULTRASONIC EQUIPMENT

Acoustica Associates, Inc.
Alcar Instruments, Inc.
Amelco, Inc.
Arenberg Ultrasonic Laboratory, Inc.
Atlantic Research Corp.
Blackstone Corp.
Branson Instruments, Inc.
J. W. Dice Co.
Du Kane Corp.
General Kinetics, Inc.
General Nuclear Corp.
Gulton Industries, Inc.
Haller Raymond & Brown, Inc.
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Massa Labs., Inc.
McKenna Labs.
John B. Moore Corp.
Narda Ultrasonics Corp., The
Photocon Research Products
Pioneer-Central Div., Bendix Aviation Corp.
Sheffield Corp., The, Sub.—Bendix Aviation Corp.
Telectro Industries Corp.
Thieblot Aviation Co., Div.—Vitro Corp. of America

WIND TUNNELS

***AMERICAN MACHINE & FOUNDRY CO.**
Coleman Engrg. Co., Inc.
Davidson Mfg. Co.
G. M. Dykes Iron Works, Inc.
Dynametrics Corp.
Flow Corp.
General Sound Control, Inc.
International Radiant Corp.
McDowell Co., Inc.
Tenney Engrg., Inc.
Thieblot Aviation Co., Div.—Vitro Corp. of America
Thompson-Ramo-Wooldridge Products Co., The
***WESTINGHOUSE ELECTRIC CORP.**

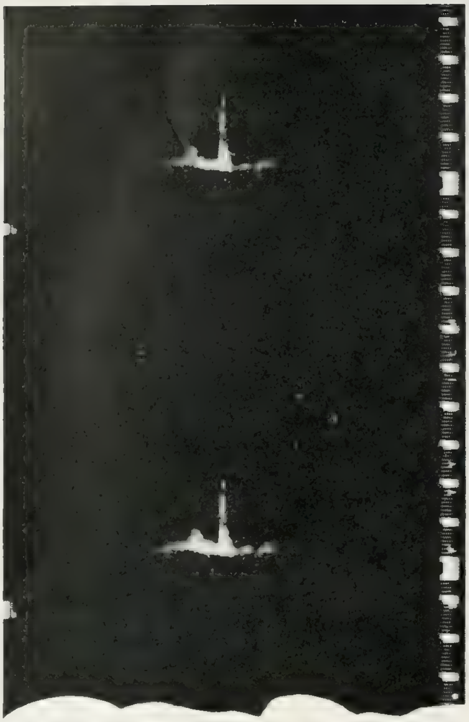
TRACKING AND TELEMETERING EQUIPMENT



These devices (optical, electronic, or both) follow a missile in flight and report on how it is actually functioning internally. This equipment includes telemetry, radio, radar and optical devices.

EXPLORER 1
"Take 1"

CAMERA: THE NEW MOD V 70-mm MISSILE TRACKING



Film: 70-mm LINAGRAPH SHELLBURST
LENS: Kodak Aero-Ektar; focal length 20-inch; lens stop, f8; range, 2000 feet approx.
Range: 2000 ft.
Camera Speed: 10 frames/second.
Shutter: 45° opening
Subject: EXPLORER I, initial flight stage, Cape Canaveral, Fla.
Date: Jan. 31, 1958
Time: 10:58 PM

That one "first take" *has* to be right for missile tracking . . . because there can't be any second trys or retakes!

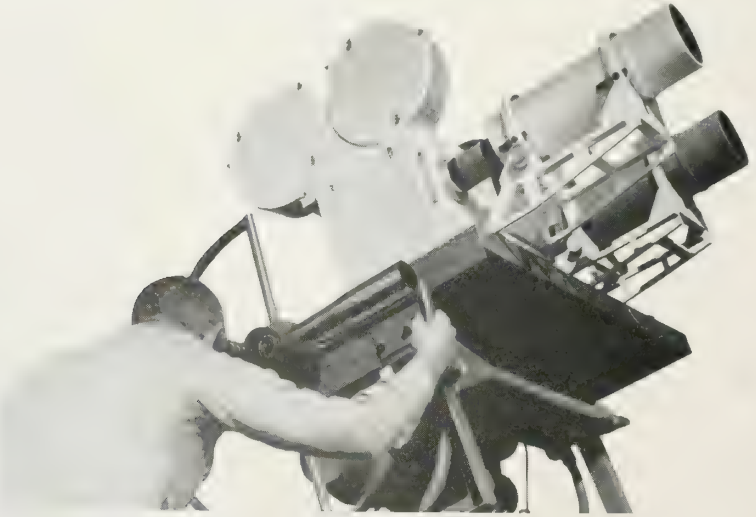
And the new Flight Research *70-mm* tracking camera is your best assurance of a *good take, every time.* This exact-size film strip proves the performance of this MULTIDATA*Mod V 70-mm—the camera that was designed specifically for missile tracking purposes.

The greater dimensions of the 70-mm field are available now for surer following of the target. The far longer range permits observation of the missile's path for greater distances. Detail is excellent, and image resolution unsurpassed.

Flight Research's unique film transport device eliminates the vibration that has plagued previous attempts to produce a satisfactory big-field data camera, and the registration pins guarantee exact frame-to-frame alignment while holding the film completely at rest during exposure.

The Mod V 70-mm is the newest member of the Flight Research advanced line of data cameras. For full information on the new Mod V, and on other photographic instrumentation equipment, call or write our engineering applications staff.

*TM



FLIGHT RESEARCH
INCORPORATED

P. O. Box 1-F, 5 Byrd Field Richmond 1, Virginia

The CAMERA
MULTIDATA **Mod V 70-mm**
Designed for missile-tracking and other extraordinary technical requirements.
Film speeds: 10 to 60 frames/second.
Film capacity: 1000 feet.
Choice of lens equipment.
Shutter adjustable: 0° to 120°.
Absolute frame-to-frame alignment.
Can be synchronized with other cameras.
Timing lights for coding with millisecond accuracy.

TRACKING AND TELEMETERING EQUIPMENT

ABSORBERS

Cleveland Pneumatic Tool Co., The, Div. — Cleveland Pneumatic Industires, Inc.
Continental-Diamond Fibre Corp., Sub.—The Budd Co.
Dwyer Engrg. Co., Inc.
Emerson & Cuming, Inc.
Farnsworth Electronics Co., Div.—Int'l Telephone & Telegraph Corp.
Filmohn Corp.
***HOUDAILLE INDUSTRIES, INC., BUFFALO HYDRAULICS DIV.**
K. W. Johnson & Co., Inc.
McMillan Inustrial Corp.
Menasco Mfg. Co.
Metavac, Inc.
Patterson Founry & Machine Co., The
Telectro Industries Corp.

ACCUMULATORS

Applied Dynamics Corp.
Baird-Atomic, Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
***COOPER DEVELOPMENT CORP.**
***DIVERSEY ENGRG. CORP.**
Hydra-Power Corp.
Kemp Aero Products, Div.—Kemp, Inc.
Menasco Mfg. Co.
Ozone Metal Products Corp.
Parker-Hannifin Corp.
Pyles Industries, Inc.
Vickers, Inc., Div.—Sperry Rand
***VICKERS, INC., MARINE & ORDNANCE DEPT., MACHINERY HYDRAULICS DIV.**
Vinson Mfg. Co., Inc.
Waldorf Instrument Co., Div.—F. C. Huyck & Sons

ACTUATORS, ELECTRIC

***ADVANCE GEAR & MACHINE CORP.**
Airborne Accessories Corp.
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Applied Dynamics Corp.
Barber-Colman Co.
Joe Davidson & Associates
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Exact Engrg. & Mfg., Inc.
Foote Brothers Gear & Machine Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Geartronics Corp.
General Nuclear Corp.
***A. W. HAYDON CO., THE**
Hoover Electric Co.
***KAHN & CO., INC.**
Lyndon Aircraft, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Servomechanisms, Inc., Mechatrol Div.
Talley Corp., The
Task Corp.
***WESTINGHOUSE ELECTRIC CORP.**

ADAPTERS

Alden Products Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Defiance Engrg. & Microwave Corp.
Electric Auto-Lite Co., The
General R-F Fittings, Inc.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Battery

Aerolite Electronics Corp.
General R-F Fittings, Inc.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Crystal

General R-F Fittings, Inc.
Telectro Industries Corp.
Western International Co.

Field Sequential

General R-F Fittings, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Foreign

Kulka Electric Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Line & Dot Sequential

Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Phase

Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Varo Mfg. Co.

Plug

Alden Products Co.
Coaxial Connector Co., Inc.
Kulka Electric Corp.
Telectro Industries Corp.

Tube

Alden Products Co.
Hickok Electrical Instrument Co., The
Telectro Industries Corp.

Tube Socket

Alden Products Co.
Hickok Electrical Instrument Co., The
Pomona Electronics Co., Inc.
Sylvania Electrical Products, Inc., Parts Div.
Telectro Industries Corp.
Vector Electronic Co.

ALARM SYSTEMS

Briggs Associates, Inc.
Browning Laboratories, Inc.
Devco Engrg., Inc.
Fenwal, Inc.
Fischer & Porter Co.
Hallamore Electronics Co.
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Lumen, Inc.
Optimized Devices, Inc.
Star Engraving Co., Ltd.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
Vap-Air Div., Vapor Heating Corp.
Victor Electric Wire & Cable Corp.

ALTERNATORS

American Electronics, Inc.
Bendix Aviation Corp., Red Bank Div.
Joe Davidson & Associates
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Georator Corp.
Guided Missile Div.—De Havilland Aircraft of Canada, Ltd.
***INTERELECTRONICS CORP.**
Motoresearch Co.
Talley Corp., The
Task Corp.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wincharger Corp.

ALTIMETERS, BAROMETRIC PRESSURE

***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Hallamore Electronics Co.
Instruments Corp., The
***WALLACE O. LEONARD, INC.**
Pioneer-Central Div., Bendix Aviation Corp.
Scientific Instrument Co.

ALTIMETERS, RADIO AND RADAR

***COOPER DEVELOPMENT CORP.**
Electronic Communications, Inc.
Gray Mfg. Co., The
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
Lear, Inc., Grand Rapids Div.
W. L. Maxson Corp., The
Pacific Div.—Bendix Aviation Corp.
Ralph M. Parsons Co., The, Electronics Div.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products, Inc.
Telectro Industries Corp.

AMMETERS

Alto Scientific Co., Inc.
Assembly Products, Inc.
Davenport Mfg. Co.
Electro Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Hammett Electric Co.
Helipot Corp.
General Electric Co., Apparatus Sales Div.
Gerard G. Leeds Co., Inc.
Meters, Inc.
National Coil Co.
Simpson Electric Co.
Sun Electric Corp.
Wacline, Inc.

AMPLIFIERS

Acro Products Co.
Acromag, Inc.
Acton Laboratories, Inc.
Advance Industries, Inc.
Airborne Accessories Corp.
Aircraft Armaments, Inc.
Airtron, Inc.
Allegany Instrument Co., Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Applied Research, Inc.
Arenberg Ultrasonic Laboratory, Inc.
Baird-Atomic, Inc.
Bogue Electric Mfg. Co.
Brush Instruments, Div.—Clevite Corp.
Centronix, Inc.
Century Electronics & Instruments, Inc.
Consolidated Airborne Systems, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS, INC.**
Daven Co., The
Du Kane Corp.
Dwyer Engrg. Co., Inc.
Dynamics Instrumentation Co., Div.-Alberhill Corp.
Electronic Assembly Co., Inc.
Feedback Controls, Inc.
Gray Mfg. Co., The
Hallamore Electronics Co.
Haller Raymond & Brown, Inc.
Heiland Div.—Minneapolis-Honeywell
Highland Engrg. Co.
Hoover Electronics Co.
***INTERELECTRONICS CORP.**
Jordan Electronics, Div.—Victoreen Instrument Co.
Keithley Instruments, Inc.
La Pointe Industries, Inc.
Lear, Inc., Grand Rapids Div.
Gerard G. Leeds Co., Inc.
L E L, Inc.
Mid-Century Instrumatic Corp.
George L. Nankervis Co.
Owen Labs., Inc.
Photron Instrument Co.
Reeves Instrument Corp.
Resdel Engrg. Corp.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Roflan Co., The
Sanborn Co.
Servomechanisms, Inc., Mechatrol Div.
Simpson Electric Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
United Electrodynamics, Div.—United Geophysical Corp.
Westbury Electronics, Inc.
Western Electro-Acoustic Lab.
Westronics, Inc.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

ANALYZERS

Advance Industries, Inc.
Analogue Controls, Inc.
Arnoux Corp.
Baird-Atomic, Inc.
Barnes Development Co.
Bogue Electric Mfg. Co.
Brush Instruments, Div.—Clevite Corp.
Canoga Corp. of California
Consolidated Electrodynamics Corp.
Dit-Mco, Inc., Electronics Div.
Dynac, Inc.
Fenske Fedrick & Miller Co.
Haller Raymond & Brown, Inc.
Lear, Inc., Grand Rapids Div.
Librascope, Inc.
Lumen, Inc.
Mid-Century Instrumatic Corp.
Pekin-Elmer Corp.
Reeves Instrument Corp.
Simpson Electric Co.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Ultradyne, Inc.
Winder Aircraft Corp. of Fla.

PHOTO ON TRACKING AND TELEMETERING DIVIDER PAGE: Tracking instrument manufactured by J. W. Fecker, Inc. of Pittsburgh, Pa.

Capacitor

Barnes Development Co.
Boonton Electronics Corp.
Consolidated Airborne Systems, Inc.
Cornell-Dubilier Electric Corp.
Simpson Electric Co.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Circuit

Advance Industries, Inc.
Bogue Electric Mfg. Co.
California Technical Industries, Div.-Textron, Inc.
James Cunningham Son & Co., Inc.
Dit-Mco, Inc., Electronics Div.
Fenske Fedrick & Miller Co.
General Electric Co., Apparatus Sales Div.
Librascope, Inc.
Skiatron Electronics & Television Corp.
Sun Electric Corp.
Telectro Industries Corp.
Westronics, Inc.
Winder Aircraft Corp. of Fla.

Differential

Analogue Controls, Inc.
Baird-Atomic, Inc.
Consolidated Avionics Corp.
General Electric Co., Apparatus Sales Div.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
Winder Aircraft Corp. of Fla.

Differential, Computer

Analogue Controls, Inc.
Baird-Atomic, Inc.
Briggs Associates, Inc.
Consolidated Avionics Corp.
Electronic Associates, Inc.
Librascope, Inc.
Mid-Century Instrumatic Corp.
Reeves Instrument Corp.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
Winder Aircraft Corp. of Fla.

Digital

Analogue Controls, Inc.
Arnoux Corp.
Austin Co., The, Special Devices Div.
Baird-Atomic, Inc.
Benson-Lehner Corp.
Briggs Associates, Inc.
Consoliated Avionics Corp.
Dynac, Inc.
Erie Resistor Corp.
Librascope, Inc.
Moran Instrument Corp.
Reeves Instrument Corp.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Flight

Analogue Controls, Inc.
California Technical Industries, Div.—Textron, Inc.
Consolidated Electrodynamics Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Reeves Instrument Corp.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Infrared

Baird-Atomic, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Greenbrier Instruments, Inc.
Librascope, Inc.
Perkin-Elmer Corp.
Philco Corp., Government & Industrial Divs.
Simpson Electric Co.
Telectro Industries Corp.

Microwave

Airborne Instruments Lab., Inc.
Baird-Atomic, Inc.
California Technical Industries, Div.—Textron, Inc.
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Demornay-Bonardi
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Microwave Electronics Div., Sperry Gyroscope Co.
Panoramic Radio Products, Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Simpson Electric Co.
Stavid Engrg., Inc.
Technical Oil Tool Corp.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.

Radar

Canoga Corp. of California
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Librascope, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Telectro Industries Corp.
*TELERAD MFG. CORP.

Ultrasonic

Acoustica Associates, Inc.
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Massa Labs., Inc.
Panoramic Radio Products, Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Wave

Empire Products Sales Corp.
Kay Electric Co.
Minneapolis-Honeywell Regulator Co.
Panoramic Radio Products, Inc.
Ryan Aeronautical Co.
Simpson Electric Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

Waveform

Benson-Lehner Corp.
Canoga Corp. of California
Consolidated Avionics Corp.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Panoramic Radio Products, Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Spectrum Instruments, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.

ANNUNCIATORS

Haller Raymond & Brown, Inc.
Optimized Devices, Inc.
Telectro Industries Corp.

ANODES, METAL

American Brass Co., The
Belmont Smelting & Refining Works, Inc.
Bram Metallurgical & Chemical Co.
Bridgeport Brass Co.
Handy & Harman
Metals & Controls Corp.

ANTENNA FEED SYSTEMS

Ainslie Corp.
Aircom, Inc.
Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Canoga Corp. of California
Collins Radio Co.
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Dayton Aircraft Products, Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
*DORNE & MARGOLIN, INC.
Diamond Antenna & Microwave Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Gabriel Co., The Gabriel Electronics Div.
Haller Raymond & Brown, Inc.
J-V-M Microwave Co.
La Pointe Industries, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Prodelin, Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Technical Appliance Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Thieblot Aviation Co., Div.—Vitro Corp. of America.
Transco Products, Inc.
Wind Turbine Co.

ANTENNA FITTINGS AND ACCESSORIES

Ainslie Corp.
Aircom, Inc.
Airtron, Inc.
American Brass Co., The
*AMERICAN TUBE BENDING CO., INC.
Andrew Corp.
Canoga Corp. of California
Collins Radio Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
*COOPER DEVELOPMENT CORP.
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Dayton Aircraft Products, Inc.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Don-Lan Electronics Co.
*DORNE & MARGOLIN, INC.
Gabriel Co., The Gabriel Electronics Div.
Isolantite Mfg. Corp.
La Pointe Industries, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Prodelin, Inc.
Technical Appliance Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Wind Turbine Co.

ANTENNA TOWER LIGHTING

Collins Radio Co.
Prodelin, Inc.
Thieblot Aviation Co., Div.—Vitro Corp. of America
*WASHINGTON ALUMINUM CO., INC.
*WESTINGHOUSE ELECTRIC CORP.
Wind Turbine Co.

ANTENNA TUNING UNITS

Aircom, Inc.
Airtron, Inc.
Andrew Corp.
Canoga Corp. of California
Collins Radio Co.
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Diamond Antenna & Microwave Corp.
Don-Lan Electronics Co.
J-V-M Microwave Co.
E. F. Johnson Co.
La Pointe Industries, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Munston Mfg. & Service, Inc.
Simpson Electric Co.
Technical Appliance Corp.
Telectro Industries Corp.
*WASHINGTON ALUMINUM CO., INC.
Wilcox Electric Co., Inc.

ANTENNAS

Advance Industries, Inc.
Aircom, Inc.
American Brass Co., The
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Bogart Mfg. Corp.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Joe Davidson & Associates
Dayton Aircraft Products, Inc.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
*DORNE & MARGOLIN, INC.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
General Electronic Labs., Inc.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
Hi-Lo Manufacturing Corp.
Lear, Inc.
Mark Products Co.
Mechanical Div.-General Mills, Inc.
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Scala Radio Co.
Stromberg-Carlson, Electronics Div.
Superex Electronics Corp.
Sylvania Electronics Systems, Div.-Sylvania Electric Products Inc.
Technical Appliance Corp.
Transco Products, Inc.
Tricraft Products Corp.
Victor Electric Wire & Cable Corp.
*WASHINGTON ALUMINUM CO., INC.

Direction Finding

Aircom Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Bogart Mfg. Corp.
Collins Radio Co.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
DORNE & MARGOLIN, INC.
Gabriel Co., The Gabriel Electronics Div.
Gulton Industries, Inc.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
La Pointe Industries Inc.
Mark Products Co.

Munston Mfg. & Service, Inc.
Nuclear Products-Erco, Div.—ACF Industries, Inc.
Prodelin Inc.
Radio Corporation of America, Defense Electronic Products
Scala Radio Co.
Simmonds Aerocessories, Inc.
Simpson Electric Co.
Stromberg-Carlson, Electronics Div.
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Appliance Corp.
Telectro Industries Corp.
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Westbury Electronics Inc.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

Fixed Station

American Electronics Labs., Inc.
Andrew Corp.
Bogart Mfg. Corp.
Collins Radio Co.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Defiance Engrg. & Microwave Corp.
*DORNE & MARGOLIN, INC.
Freeman Co., The
Gabriel Co., The Gabriel Electronics Div.
Gulton Industries, Inc.
E. F. Johnson Co.
Herb Kreckman Co.
La Pointe Industries Inc.
Mark Products Co.
Munston Mfg. & Service, Inc.
Prodelin Inc.
*RADIATION, INC.
Radio Corporation of America, Defense Electronic Products
Scala Radio Co.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Appliance Corp.
Thieblot Aviation Co., Div.-Vitro Corp. of America
*WASHINGTON ALUMINUM CO., INC.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

High Frequency

Ainslie Corp.
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Bogart Mfg. Corp.
Collins Radio Co.
Dale Products, Inc.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
*DORNE & MARGOLIN, INC.
Freeman Co., The
Gabriel Co., The, Gabriel Electronics Div.
Gulton Industries, Inc.
J-V-M Microwave Co.
La Pointe Industries Inc.
Mark Products Co.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Stavid Engrg., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Appliance Corp.
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Westbury Electronics Inc.
Wilcox Electric Co., Inc.
Wind Turbine Co.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Loop-Direction Finder

Bendix Radio Div.-Bendix Aviation Corp.
Bogart Mfg. Corp.
Defiance Engrg. & Microwave Corp.
*DORNE & MARGOLIN, INC.
Gabriel Co., The, Gabriel Electronics Div.
Gulton Industries, Inc.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
La Pointe Industries Inc.
Lear, Inc.
Munston Mfg. & Service, Inc.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic products
Superex Electronics Corp.
Technical Appliance Corp.
*WASHINGTON ALUMINUM CO., INC.
Wilcox Electric Co., Inc.
Winder Aircraft Corp. of Fla.

Low Frequency

Advance Industries, Inc.
Ainslie Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Bogart Mfg. Corp.
Canoga Corp. of California
Dale Products, Inc.
Defiance Engrg. & Microwave Corp.
*DORNE & MARGOLIN, INC.
J-V-M Microwave Co.
La Pointe Industries Inc.
Munston Mfg. & Service, Inc.
Nuclear Products-Erco, Div.—ACF Industries, Inc.
Prodelin Inc.
Radio Corporation of America, Defense Electronic Products
Simpson Electric Co.
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Appliance Corp.
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Microwave-Radar

Adler Electronics, Inc.
Ainslie Corp.
Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
American Electronic Labs., Inc.
Andrew Corp.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
Canoga Corp. of California
Collins Radio Co.
Dale Products, Inc.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Joe Davidson & Associates
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
*DORNE & MARGOLIN, INC.
Eclipse-Pioneer Div.-Bendix Aviation Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Gabriel Co., The, Gabriel Electronics Div.
General Precision Lab. Inc.
John Gombos Co., Inc.
Goodyear Aircraft Corp.
Gulton Industries, Inc.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
J-V-M Microwave Co.
Kelsey-Hayes Co.
D. S. Kennedy & Co.
La Pointe Industries Inc.
Mark Products Co.
Mechanical Div.-General Mills, Inc.
Microwave Development Labs., Inc.
Microwave Electronics Div.-Sperry Gyroscope Co.
Narda Microwave Corp., The
Polarad Electronics Corp.
Prodelin Inc.
Radio Corporation of America, Defense Electronic Products.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Scientific-Atlanta, Inc.
Spincraft, Inc.
Stavid Engrg., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Appliance Corp.
Technical Oil Tool Corp.
*TELERAD MFG. CORP.
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Waveline, Inc.
Westbury Electronics, Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Radar

Ainslie Corp.
Airtron, Inc.
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Bendix Radio Div.—Bendix Aviation Corp.
Bogart Mfg. Corp.
Canoga Corp. of California
Collins Radio Co.
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
*DORNE & MARGOLIN, INC.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Gabriel Co., The, Gabriel Electronics Div.
Goodyear Aircraft Corp.
Gulton Industries, Inc.
Haller Raymond & Brown, Inc.
J-V-M Microwave Co.
Kelsey-Hayes Co.
D. S. Kennedy & Co.
La Pointe Industries, Inc.
Mechanical Div.—General Mills, Inc.
Microwave Development Labs., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
*RADIATION, INC.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Ryan Aeronautical Co.
Sanders Associates, Inc.
Stavid Engrg., Inc.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
Technical Appliance Corp.
Technical Oil Tool Corp.
*TELERAD MFG. CORP.
Transco Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Westbury Electronics, Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Rotary Beam

*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Bogart Mfg. Corp.
Collins Radio Co.
Defiance Engrg. & Microwave Corp.
*DORNE & MARGOLIN, INC.
Freeman Co., The
Gabriel Co., The, Gabriel Electronics Div.
Gulton Industries, Inc.
Haller Raymond & Brown, Inc.
J-V-M Microwave Co.
La Pointe Industries, Inc.
Mark Products Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Munston Mfg. & Service, Inc.
*RADIATION, INC.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
Scala Radio Co.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
*WASHINGTON ALUMINUM CO., INC.
Wind Turbine Co.,
Winder Aircraft Corp. of Fla.

Slotted Line

Aircom, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
Canoga Corp. of California
Collins Radio Co.
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
*DORNE & MARGOLIN, INC.
Gabriel Co., The, Gabriel Electronics Div.
General Precision Lab., Inc.
Gulton Industries, Inc.
Haller Raymond & Brown, Inc.
J-V-M Microwave Co.
La Pointe Industries, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Radio Corporation of America, Defense Electronic Products
Sanders Associates, Inc.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
Technial Appliance Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.
Wacline, Inc.
*WASHINGTON ALUMINUM CO., INC.
Westbury Electronics, Inc.
Winder Aircraft Corp. of Fla.

Ultra High Frequency

Adler Electronics, Inc.
Ainslie Corp.
Aircom, Inc.
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Bogart Mfg. Corp.
Canoga Corp. of California
Collins Radio Co.
*COOPER DEVELOPMENT CORP.
Dale Products, Inc.
*DALMO VICTOR CO., DIV.—TEXTRON, INC.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
*DORNE & MARGOLIN, INC.
Gabriel Co., The, Gabriel Electronics Div.
General Electronic Labs., Inc.
Gulton Industries, Inc.
Haller Raymond & Brown, Inc.
Hi-Lo Manufacturing Corp.
Hycon Eastern, Inc.
J-V-M Microwave Co.
Kelsey-Hayes Co.
D. S. Kennedy & Co.
Herb Kreckman Co.
La Pointe Industries, Inc.
Mark Products Co.
Narda Microwave Corp., The
Radio Corporation of America, Defense Electronic Products
Sanders Associates
Scala Radio Co.
Simmonds Aerocessories, Inc.
Stavid Engrg., Inc.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
Technical Appliance Corp.
Telectro Industries Corp.
Transco Products, Inc.
Tricraft Products Corp.
Winder Aircraft Corp. of Fla.

. . . tracking & telemetering

Very High Frequency

Ainslie Corp.
Aircom, Inc.
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Andrew Corp.
Bogart Mfg. Corp.
Canoga Corp. of California
Collins Radio Co.
*COOPER DEVELOPMENT CORP.
Dale Products, Inc.
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
*DORNE & MARGOLIN, INC.
Freeman Co., The
Gabriel Co., The, Gabriel Electronics Div.
Gulton Industries, Inc.
Haller Raymond & Brown, Inc.
Hi-Lo Manufacturing Corp.
Hycon Eastern, Inc.
Kelsey-Hayes Co.
D. S. Kennedy & Co.
Herb Kreckman Co.
La Pointe Industries, Inc.
Lear, Inc.
Mark Products Co.
*RADIATION, INC.
Radio Corporation of America, Defense Electronic Products
Sanders Associates, Inc.
Scala Radio Co.
Simmonds Aerocessories, Inc.
Stavid Engrg., Inc.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
Technical Appliance Corp.
Telectro Industries Corp.
Transco Products, Inc.
Tricraft Products Corp.
*WASHINGTON ALUMINUM CO., INC.
Winder Aircraft Corp. of Fla.

ASSEMBLERS, FEEDERS

Barnes Development Co.
Ryan Aeronautical Co.
Telectro Industries Corp.

ASSEMBLIES, MICROWAVE

Ainslie Corp.
Aircom, Inc.
Aircraft Armaments, Inc.
Airtron, Inc.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
Canoga Corp. of California
Coaxial Connector Co., Inc.
Collins Radio Co.
*COOPER DEVELOPMENT CORP.
Diamond Antenna & Microwave Corp.
Gabriel Co., The, Gabriel Electronics Div.
John Gombos Co., Inc.
Goodyear Aircraft Corp.
Hoover Electronics Co.
J-V-M Microwave Co.
Mechanical Div.—General Mills, Inc.
Mutron Corp.
Nuclear Products—Erco, Div.—ACF Industries, Inc.
Omega Labs., Inc.
Polarad Electronics Corp.
Prodelin, Inc.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sylvania Electronic Systems, Div.—Sylvania Electric Products, Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Transco Products, Inc.
Uniwave, Inc.
Wacline, Inc.
Waveguide, Inc.
Waveline, Inc.
Westbury Electronics, Inc.
Wunderlich Radio Co.

ATTENUATORS

Applied Research, Inc.
Bogart Mfg. Corp.
Daven Co., The
Diamond Antenna & Microwave Corp.
General Communication Co.
Leeds & Northrup Co.
Metavac, Inc.
North Hills Electric Co., Inc.
Reeves Instrument Corp.
Telectro Industries Corp.
Telonic Industries, Inc.
Wacline, Inc.

a-f

Daven Co., The
Kay Electric Co.
North Hills Electric Co., Inc.
Telectro Industries Corp.

Audio

Daven Co., The
Kay Electric Co.
Ryan Aeronautical Co.
Telectro Industries Corp.

Logarithmic

Arenberg Ultrasonic Laboratory, Inc.
Daven Co., The
Telectro Industries Corp.

Microwave

Aircom Inc.
Airtron, Inc.
Applied Research Inc.
Bogart Mfg. Corp.
Canoga Corp. of California
Coaxial Connector Co. Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Electro Impulse Lab., Inc.
Electron-Radar Products
Elektro-Serv Co.
Empire Products Sales Corp.
General Communication Co.
John Gombos Co., Inc.
Hansen Electronics Co.
Hoover Electronics Co.
J-V-M Microwave Co.
McMillan Industrial Corp.
Metavac, Inc.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Omega Labs., Inc.
Polarad Electronics Corp.
Pyrofilm Resistor Co., Inc.
Radar Design Corp.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Sanders Associates, Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Thompson Products, Inc.
Uniwave, Inc.
Wacline, Inc.
Waveguide, Inc.
Waveline, Inc.
Weinschel Engrg.

Precision

Adler Electronics, Inc.
Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Cal-Ohm Labs., Inc.
Daven Co., The
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Empire Products Sales Corp.
General Communication Co.
Leeds & Northrup Co.
Metavac, Inc.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
North Hills Electric Co., Inc.
Pyrofilm Resistor Co., Inc.
Radar Design Corp.
Sage Laboratories, Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
Telonic Industries, Inc.
Weinschel Engrg.

r-f & i-f

Adler Electronics, Inc.
Airborne Instruments Lab., Inc.
Airtron, Inc.
Applied Research Inc.
Arenberg Ultrasonic Laboratory, Inc.
BJ Electronics, Borg-Warner Corp.
Canoga Corp. of California
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Elektro-Serv Co.
Empire Products Sales Corp.
Entron, Inc.
General Communication Co.
J-V-M Microwave Co.
Kay Electric Co.
Metavac, Inc
Microlab
North Hills Electric Co., Inc.
Polarad Electronics Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Telonic Industries, Inc.
Uniwave, Inc.
Weinschel Engrg.

BALLISTOCARDIOGRAPHS

Gulton Industries, Inc.
Technitrol Engrg. Co.

BASES, ANTENNA

Ainslie Corp.
American Car & Foundry Div., ACF Industries, Inc.
Canoga Corp. of California
Champion Airquipment, Inc.
Continental-Diamond Fibre Corp., Sub.-The Budd Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Elm Mfg. Co. Inc.
G. W. Galloway Co.
Houston Fearless Corp.
Kelsey-Hayes Co.
La Pointe Industries Inc.
R. C. Mahon Co., The
Permax Products Div., Chisholm-Ryder Co., Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Terminal Radio Corp.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.
Winder Aircraft Corp. of Fla.

BASES, DIODE

Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

BASES, RELAY

Alden Products Co.
General Railway Signal Co.
Simpson Electric Co.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

BASES, TRANSISTOR

Terminal Radio Corp.

BEACONS, RADAR

*AMERICAN MACHINE & FOUNDRY CO.
Avion Div., ACF Industries, Inc.
Bendix Aviation Corp., York Div.
Canoga Corp. of California
*COOPER DEVELOPMENT CORP.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Diamond Antenna & Microwave Corp.
Electronic Communications, Inc.
General Communication Co.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
J-V-M Microwave Co.
Lavoie Labs., Inc.
Pacific Div.-Bendix Aviation Corp.
Ralph M. Parsons Co., The, Electronics Div.
Reeves Instrument Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
*TELERAD MFG. CORP.
United Mfg. Co., The
*WASHINGTON ALUMINUM CO., INC.

BELLS & BUZZERS

E. F. Johnson Co.
Telectro Industries Corp.

BINDING POSTS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Affiliated Screw Products Co.
Amatom Electronic Hardware Co. Inc.
Birnbach Radio Co., Inc.
Elco Corp.
*GRAPHITE METALLIZING CORP.
E. F. Johnson Co.
Litton Industries, Components Div.
Malco Tool & Mfg. Co.
Star Engraving Co., Ltd.

BLOWERS, TRANSMITTER

American Electronics, Inc.
Dean & Benson Research Inc.
Electronic Techniques, Inc.
McLean Engrg. Laboratories
Rotron Mfg. Co.
Stanat Mfg. Co., Inc.
Talley Corp., The

BOARDS, CAPACITOR OR RESISTOR

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Alden Products Co.
Dale Products, Inc.
Electronic Techniques, Inc.
Elm Mfg. Co. Inc.
Erie Resistor Corp.
Keystone Electronics Corp.
La Pointe Industries Inc.
Litton Industries, Components Div.
Specific Products
Star Engraving Co., Ltd.
Telectro Industries Corp.

BOARDS, PLOTTING

Accurate Electronics Corp., Dept. D
Continental-Diamond Fibre Corp., Sub.-The Budd Co.
Eljay Corp.
Elm Mfg. Co. Inc.
Fenske Fedrick & Miller Co.
Industrial Engravers Inc.
Skiatron Electronics & Television Corp.
Universal Unlimited, Inc.
Virginia Plak Co.
***WASHINGTON ALUMINUM CO., INC.**

BOBBINS, COIL WINDING

Aerolite Electronics Corp.
Alden Products Co.
Central Coil Co. Inc.
Continental-Diamond Fibre Corp., Sub.-The Budd Co.
Ferroxcube Corp. of America
Hydro Molding Co. Inc.
Isolantite Mfg. Corp.
Penn Fibre & Specialty Co., Inc.
D. M. Steward Mfg. Co.
Topper Mfg. Co., Inc.

BOBBINS, TRANSFORMER WINDING

Central Coil Co. Inc.
Continental-Diamond Fibre Corp., Sub.-The Budd Co.
Hydro Molding Co. Inc.
National Coil Co.
Penn Fibre & Specialty Co., Inc.
Ryan Aeronautical Co.
D. M. Steward Mfg. Co.
Topper Mfg. Co., Inc.

BOXES, JUNCTION

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Airtron, Inc.
Continental-Diamond Fibre Corp., Sub.-The Budd Co.
General Railway Signal Co.
Grimes Mfg. Co.
***KAHN & CO., INC.**
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Telectro Industries Corp.

BRIDGES

Allegany Instrument Co., Inc.
Alpha Instrument Co.
Barnes Development Co.
Boonton Radio Corp.
Briggs Associates, Inc.
Davenport Mfg. Co.
Electro-Measurements Inc.
Gertsch Products Inc.
Gray Instrument Co.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Marconi Instruments
Munston Mfg. & Service, Inc.
Simpson Electric Co.

Capacitance

Alpha Instrument Co.
Barnes Development Co.
Boonton Electronics Corp.
Briggs Associates, Inc.
Cambridge Instrument Company, Inc.
Cornell-Dubilier Electric Corp.
Electro-Measurements Inc.
Elm Mfg. Co. Inc.
Industrial Control Co.
Leeds & Northrup Co.
Marconi Instruments
Munston Mfg. & Service, Inc.
Network Mfg. Corp.
Simmonds Aerocessories, Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Cathode Interface Impedance

Briggs Associates, Inc.
Simpson Electric Co.
Telectro Industries Corp.

Electrical

Alpha Instrument Co.
Barnes Development Co.
General Electric Co., Apparatus Sales Div.
James G. Biddle Co.
Cambridge Instrument Company, Inc.
Gray Instrument Co.
Simpson Electric Co.
Telectro Industries Corp.

Impedance

Acton Laboratories Inc.
Airtron, Inc.
Alpha Instrument Co.
Barnes Development Co.
Boonton Radio Corp.
Electro-Measurements Inc.
Industrial Instruments Inc.
Leeds & Northrup Co.
Marconi Instruments
Munston Mfg. & Service, Inc.
Narda Microwave Corp., Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Inductance

Alpha Instrument Co.
Barnes Development Co.
Cambridge Instrument Company, Inc.
Crescent Engrg. & Research Co.
Electro-Measurements Inc.
Hickok Electrical Instrument Co., The
Leeds & Northrup Co.
Marconi Instruments
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Megohm

Barnes Development Co.
James G. Biddle Co.
Davenport Mfg. Co.
Industrial Instruments Inc.
Leeds & Northrup Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.

Resistance

Allegany Instrument Co., Inc.
Alpha Instrument Co.
Barnes Development Co.
James G. Biddle Co.
Cal-Ohm Labs., Inc
Cambridge Instrument Company, Inc.
Electro-Measurement Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Gray Instrument Co.
Hickok Electrical Instrument Co., The
Industrial Instruments Inc.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Marconi Instruments
Minneapolis-Honeywell Regulator Co., Indust. Div.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
United Control Corp.

R-F

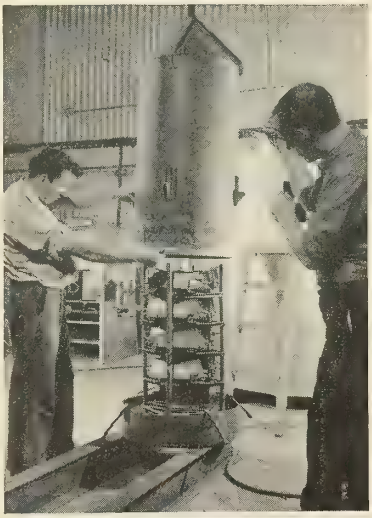
Barnes Development Co.
Boonton Radio Corp.
Hickok Electrical Instrument Co., The
Marconi Instruments
Munston Mfg. & Service, Inc.
Simpson Electric Co.
Telectro Industries Corp.

Self-Balancing

Avien, Inc.
Barnes Development Co.
Columbia Research Labs.
Hickok Electrical Instrument Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Moran Instrument Corp.
North Atlantic Industries, Inc.
Simmonds Aerocessories, Inc.
Simpson Electric Co.
Telectro Industries Corp.
United Control Corp.

Standing Wave

Browning Laboratories, Inc.
Demornay-Bonardi



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Microwave Electronics Div., Sperry Gyroscope Co.
Simpson Electric Co.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.
Waveline, Inc.

Synchro

Electro-Measurements Inc.
Gray Instrument Co.
Simpson Electric Co.
Telectro Industries Corp.
Theta Instrument Corp.

vhf

Barnes Development Co.
Boonton Radio Corp.
Marconi Instruments
Simpson Electric Co.
Telectro Industries Corp.

Wheatstone

Allegany Instrument Co., Inc.
Barnes Development Co.
Cal-Ohm Labs., Inc.
Cambridge Instrument Company, Inc.
Crescent Engrg. & Research Co.
Electro-Measurements Inc.
Electro-Tech Equipment Co.
Gray Instrument Co.
*KAHN & CO., INC.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Simpson Electric Co.
Telectro Industries Corp.
United Control Corp.

CAMERA AUXILIARY EQUIPMENT

Beckman & Whitley, Inc.
Benson-Lehner Corp.
Boston Insulated Wire & Cable Co.
Cameraflex Corp.
J. W. Fecker, Inc.-Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
Graflex, Inc.
*HAYWARD SCIENTIFIC GLASS CORP.
Hershey Mfg. Co.
Houston Fearless Corp.
Huber Industries, Inc.
Librascope Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Optomechansims Inc.
Reeves Instrument Corp.
Traid Corp.
Vought Co.
Wollensak Optical Co.

CAMERA MOUNTS

Abrams Instrument Corp.
Benson-Lehner Corp.
Cameraflex Corp.
Christie Machine Works
Sherman Fairchild & Assoc. Inc.
J. W. Fecker, Inc. Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
G. W. Galloway Co.
Graflex, Inc.
Houston Fearless Corp.
Huber Industries Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
O & M Machine Co., Inc.
Optomechansims Inc.
Reeves Instrument Corp.
Robinson Aviation, Inc.
Traid Corp.
Vought Co.
Wollensak Optical Co.

CAMERAS

Allegany Instrument Co., Inc.
Beattie-Coleman Inc.
Benson-Lehner Corp.
Cameraflex Corp.
Christie Machine Works
Eastman Kodak Co.
Sherman Fairchild & Assoc. Inc.
J. W. Fecker, Inc. Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
Haller Raymond & Brown Inc.
Houston Fearless Corp.
Land-Air, Inc., Sub.-California Eastern Aviation, Inc.
Librascope Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Optomechanisms Inc.
Perkin-Elmer Corp.
Traid Corp.
Wollensak Optical Co.

Data Recording

Abrams Instrument Corp.
Allegany Instrument Co., Inc.
American Electronics, Inc.
Beattie-Coleman, Inc.
Benson-Lehner Corp.
Cameraflex Corp.
Edgerton, Germeshausen & Grier, Inc.
Sherman Fairchild & Assoc. Inc.
J. W. Fecker, Inc. Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
Graflex, Inc.
Haller Raymond & Brown Inc.
Houston Fearless Corp.
Land-Air, Inc., Sub.-California Eastern Aviation, Inc.
Librascope Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Optomechansims Inc.
Perkin-Elmer Corp.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Traid Corp.
Vought Co.
Wollensak Optical Co.

High Speed

Allegany Instrument Co., Inc.
Beckman & Whitley, Inc.
Benson-Lehner Corp.
Cameraflex Corp.
Christie Machine Works
Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
Sherman Fairchild & Assoc. Inc.
Fairchild Camera & Instrument Corp., Industrial Camera Div.
J. W. Fecker, Inc. Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
Haller Raymond & Brown Inc.
Librascope Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Optomechansims Inc.
Traid Corp.
Vought Co.
Wollensak Optical Co.

Motion Picture

Benson-Lehner Corp.
Cameraflex Corp.
Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
Sherman Fairchild & Assoc. Inc.
Fairchild Camera & Instrument Corp., Industrial Camera Div.
J. W. Fecker, Inc. Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
Houston Fearless Corp.
Librascope Inc.
J. A. Maurer, Inc.
Perkin-Elmer Corp.
Traid Corp.
Vought Co.
Wollensak Optical Co.

Oscilloscope

Beattie-Coleman, Inc.
Beckman & Whitley, Inc.
Cameraflex Corp.
Edgerton, Germeshausen & Grier, Inc.
Electro-Medical Lab., Inc.
Fairchild Camera & Instrument Corp., Industrial Camera Div.
J. W. Fecker, Inc. Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
Grass Instrument Co.
Houston Fearless Corp.
Land Air, Inc., Sub.-California Eastern Aviation, Inc.
J. A. Maurer, Inc.
Optomechansims Inc.
Panoramic Radio Products, Inc.
Telechrome Mfg. Corp.
Traid Corp.
Vought Co.
Wollensak Optical Co.

Recording, Radar and Oscilloscope

Abrams Instrument Corp.
Beattie-Coleman, Inc.
Cameraflex Corp.
Edgerton, Germeshausen & Grier, Inc.
Fairchild Camera & Instrument Corp., Industrial Camera Div.
J. W. Fecker, Inc. Sub.-American Optical Co.
*FLIGHT RESEARCH, INC.
Haller Raymond & Brown Inc.
Houston Fearless Corp.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Librascope Inc.
J. A. Maurer, Inc.
Optomechansims Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Specialties, Inc.
Traid Corp.
Vought Co.
Wollensak Optical Co.

Television

Cameraflex Corp.
General Precision Lab. Inc.
Hallamore Electronics Co.
J. W. Fecker, Inc. Sub.-American Optical Co.
Perkin-Elmer Corp.
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Thompson Products, Inc.
Traid Corp.

CAPACITOR SPECIALTIES MEASUREMENT

Barnes Development Co.
Boonton Electronics Corp.
Consolidated Airborne Systems, Inc.
Southern Electronics Corp.
Terminal Radio Corp.

CAPACITORS

Airborne Accessories Corp.
Associated American Winding Co., Inc.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Cornell-Dubilier Electric Corp.
Corning Glass Works
Dearborn Electronic Laboratories
Electro-Measurements Inc.
Electronic Fabricators, Inc.
Erie Resistor Corp.
Fansteel Metallurgical Corp.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lapp Insulator Co., Inc., Radio Specialties Div.
Leeds & Northrup Co.
Lenkurt Electric Co., Inc.
Minitronics Corp.
Onondaga Pottery Co., Electronics Div.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United Electronics Co.

Ceramic

American Lava Corp.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Electric Auto-Lite Co., The
Erie Resistor Corp.
John E. Fast & Co.
Good-All Electric Mfg. Co.
Gudeman Co., The
Gulton Industries, Inc.
Illinois Condenser Co.
P. R. Mallory & Co. Inc.
Onondaga Pottery Co., Electronics Div.
Potter Co., The
Radio Industries, Inc.
Sangamo Electric Co.
Terminal Radio Corp.
Western Gold & Platinum

Ceramic Trimmer

Electric Auto-Lite Co., The
Erie Resistor Corp.
Terminal Radio Corp.

Composition

Cornell-Dubilier Electric Corp.
Terminal Radio Corp.

Decade

Balco Research Labs., Inc., Capacitor Div.
Cornell-Dubilier Electric Corp.
Electro-Measurements Inc.
Leeds & Northrup Co.
Potter Co., The
Precise Development Corp.
Southern Electronics Corp.
Terminal Radio Corp.

Electrolytic

Cornell-Dubilier Electric Corp.
Electro-Capacitors Co., Inc.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
P. R. Mallory & Co., Inc.
Minitronics Corp.
Minneapolis-Honeywell Regulator Co., Boston Div.
Sangamo Electric Co.
Terminal Radio Corp.

Feed-Through

Airborne Accessories Corp.
Axel Electronics

Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Dearborn Electronic Laboratories
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
Gudeman Co., The
Hallett Mfg. Co.
P. R. Mallory & Co., Inc.
Potter Co., The
Radio Industries, Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Vitramon, Inc.

Fixed

Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Corning Glass Works
Dearborn Electronic Laboratories
Electric Auto-Lite Co., The
Electronic Fabricators, Inc.
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lapp Insulator Co., Inc., Radio Specialties Div.
Lenkurt Electric Co., Inc.
P. R. Mallory & Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Radio Industries, Inc.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United Electronics Co.
Vitramon, Inc.

Gas-Filled

Lapp Insulator Co., Inc., Radio Specialties Div.
Terminal Radio Corp.

Glass

Corning Glass Works
Erie Resistor Corp.
Potter Co., The
Terminal Radio Corp.

Glass Trimmer

Atlas E-E Corp.
Corning Glass Works
Erie Resistor Corp.
Terminal Radio Corp.

Hermetically Sealed

Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Corning Glass Works
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Erie Resistor Corp.
Fansteel Metallurgical Corp.
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Lenkurt Electric Co., Inc.
Minitronics Corp.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Vitramon, Inc.

High Temperature

Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Corning Glass Works
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Erie Resistor Corp.
Fansteel Metallurgical Corp.
John E. Fast & Co.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Jennings Radio Mfg. Corp.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United Electronics Co.
Vitramon, Inc.

High Voltage

AMP Inc.
Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Corning Glass Works
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Erie Resistor Corp.
John E. Fast & Co.
Filtron Co., Inc.
Gudeman Co., The
Hammett Electric Co.
Illinois Condenser Co.
Jennings Radio Mfg. Corp.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Plastic Capacitors, Inc.
Potter Co., The
Radio Industries, Inc.
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United Electronics Co.
*WESTINGHOUSE ELECTRIC CORP.

Industrial

Axel Electronics
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Dearborn Electronic Laboratories
Electric Auto-Lite Co., The
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
P. R. Mallory & Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
*WESTINGHOUSE ELECTRIC CORP.

Metallized Paper

Cornell-Dubilier Electric Corp.
Dearborn Electronic Laboratories
Filtron Co., Inc.
Gudeman Co., The
Illinois Condenser Co.
P. R. Mallory & Co., Inc.
Potter Co., The
Peter J. Schweitzer, Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.

Mica

Cornell-Dubilier Electric Corp.
Erie Resistor Corp.
Sangamo Electric Co.
Terminal Radio Corp.

Mica Trimmer

Terminal Radio Corp.

Miniature

Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Corning Glass Works
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Erie Resistor Corp.
Fansteel Metallurgical Corp.
John E. Fast & Co.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
E. F. Johnson Co.
P. R. Mallory & Co., Inc.
McCoy Electronics Co.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Scintilla Div., Bendix Aviation Corp.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Vitramon, Inc.

Modulated Sweep

Terminal Radio Corp.
Wacline, Inc.

Mylar Dielectric

Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Cornell-Dubilier Electric Corp.
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
John E. Fast & Co.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
Lenkurt Electric Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Saratoga Industries
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.

Neutralizing

E. F. Johnson Co.
Terminal Radio Corp.
Tobe Deutschmann Corp.

Oil

Axel Electronics
Cornell-Dubilier Electric Corp.
Dearborn Electronic Laboratories
John F. Fast & Co.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
Lehigh Chemical Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Terminal Radio Corp.
Tobe Deutschmann Corp.

Oil Filled

Axel Electronics
Cornell-Dubilier Electric Corp.
Dearborn Electronic Laboratories
John F. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
Lenkurt Electric Co., Inc.
P. R. Mallory & Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Terminal Radio Corp.
Tobe Deutschmann Corp.

Paper

Axel Electronics
Cornell-Dubilier Electric Corp.
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
John E. Fast & Co.
Filtron Co., Inc.
General Electric Co., Apparatus Sales Div.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
Lenkurt Electric Co., Inc.
P. R. Mallory & Co. Inc.
New York Coil Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Terminal Radio Corp.
Tobe Deutschmann Corp.

Piston

Terminal Radio Corp.

Plastic

Balco Research Labs., Inc., Capacitor Div.
Cornell-Dubilier Electric Corp.
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
John E. Fast & Co.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Waterbury Companies, Inc.
Westlake Plastics, CrystalX Corp.

Plug-In

Balco Research Labs., Inc., Capacitor Div.

. . . tracking & telemetering

Cornell Dubilier Electric Corp.
Good-All Electric Mfg. Co.
Gudeman Co., The
Onondaga Pottery Co., Electronics Div.
Plastic Capacitors, Inc.
Radio Industries, Inc.
Sangamo Electric Co.
Terminal Radio Corp.
Westlake Plastics, CrystalX Corp.

Polystyrene Insulated

Airborne Accessories Corp.
Balco Research Labs., Inc., Capacitor Div.
Cornell-Dubilier Electric Corp.
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Electro-Measurements Inc.
Electronic Fabricators, Inc.
John E. Fast & Co.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
Lenkurt Electric Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Westlake Plastics, CrystalX Corp.

Porcelain

Potter Co., The
Telectro Industries Corp.
Terminal Radio Corp.
Vitramon, Inc.

Precision

Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Corning Glass Works
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Erie Resistor Corp.
Good-All Electric Mfg. Co.
Gudeman Co., The
E. F. Johnson Co.
Leeds & Northrup Co.
Lenkurt Electric Co., Inc.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Telectro Industries Corp.
Tobe Deutschmann Corp.
United Electronics Co.

Pressure Types

Sangamo Electric Co.
Southern Electronics Corp.
Terminal Radio Corp.
Vitramon, Inc.

Printed Circuit

Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Erie Resistor Corp.
John E. Fast & Co.
Good-All Electric Mfg. Co.
Gudeman Co., The
P. R. Mallory & Co. Inc.
Mica Corp.
Milmanco
Onondaga Pottery Co., Electronics Div.
Plastic Capacitors, Inc.
Radio Industries, Inc.
Sangamo Electric Co.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United-Carr Fastener Corp.

Receiver Tuning

P. R. Mallory & Co. Inc.
McCoy Electronics Co.
Sangamo Electric Co.
Terminal Radio Corp.

Silicone-Filled

Axel Electronics
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Filtron Co., Inc.
Gudeman Co., The
Illinois Condenser Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Terminal Radio Corp.

Silvered Mica

Cornell-Dubilier Electric Corp.
Erie Resistor Corp.
Gudeman Co., The
Leeds & Northrup Co.
Sangamo Electric Co.
Terminal Radio Corp.

Standard

Airborne Accessories Corp.
Balco Research Labs., Inc., Capacitor Div.
Boonton Electronics Corp.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Electric Auto-Lite Co., The
Good-All Electric Mfg. Co.
E. F. Johnson Co.
Leeds & Northrup Co.
Plastic Capacitors, Inc.
Sangamo Electric Co.
Southern Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Tantalum

Cornell-Dubilier Electric Corp.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div
Gudeman Co., The
Illinois Condenser Co.
P. R. Mallory & Co. Inc.
Minitronics Corp.
Terminal Radio Corp.

Teflon

Airborne Accessories Corp.
Axel Electronics
Balco Research Labs., Inc., Capacitor Div.
Cornell-Dubilier Electric Corp.
Corson Electric Mfg. Corp.
Dearborn Electronic Laboratories
Electronic Fabricators, Inc.
Filtron Co., Inc.
Good-All Electric Mfg. Co.
Gudeman Co., The
Illinois Condenser Co.
Plastic Capacitors, Inc.
Potter Co., The
Sangamo Electric Co.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Tri-Point Plastics Inc.

Temperature Compensated

Balco Research Labs., Inc., Capacitor Div.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Cornell-Dubilier Electric Corp.
Dearborn Electronic Laboratories
Erie Resistor Corp.
Gudeman Co., The
Onondaga Pottery Co., Electronics Div.
Plastic Capacitors, Inc.
Radio Industries, Inc.
Sangamo Electric Co.
Southern Electronics Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.

Transmitter Tuning

Erie Resistor Corp.
Jennings Radio Mfg. Corp.
E. F. Johnson Co.
Sangamo Electric Co.
Terminal Radio Corp.
United Electronics Co.
Vacap Corp.

Transmitting

Cornell-Dubilier Electric Corp.
Corning Glass Works
Dolinko & Wilkens, Inc.
Erie Resistor Corp.
John E. Fast & Co.
Jennings Radio Mfg. Corp.
E. F. Johnson Co.
Plastic Capacitors, Inc.
Sangamo Electric Co.
Terminal Radio Corp.
United Electronics Co.
Vacap Corp.

Vacuum Types

Dolinko & Wilkens, Inc.
Jennings Radio Mfg. Corp.
Potter Co., The
Terminal Radio Corp.
United Electronics Co.
Vacap Corp.

Variable

Don-Lan Electronics Co.
Jennings Radio Mfg. Corp.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
McCoy Electronics Co.
Sarkes Tarzian, Inc.
Southern Electronics Corp.
Terminal Radio Corp.
United Electronics Co.
Vacap Corp.

CARTRIDGES, CRYSTAL

Elm Mfg. Co. Inc.
Magnavox Co., The
Ryan Aeronautical Co.
Shure Brothers, Inc.
Terminal Radio Corp.

CASES, DIODE & TRANSISTOR

Corning Glass Works
Electrical Industries, Div.-Philips Electronics, Inc.
Gasket, Packing & Specialty Co. Inc.
Terminal Radio Corp.
***WASHINGTON ALUMINUM CO., INC.**

CASES, TRANSFORMER

ACF Industries, Inc., Advanced Products Div.
General Railway Signal Co.
Great Eastern Metal Products Co.
Terminal Radio Corp.
Transonic, Inc.

CATHODES

Bram Metallurgical & Chemical Co.
Superior Tube Co.
Terminal Radio Corp.

CELLS, PHOTOELECTRIC

Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
Electronics Corp. of America
General Electric Co., Apparatus Sales Div.
Infrared Industries Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

CHECKERS, CATHODE RAY TUBE

Hi-Lo Manufacturing Corp.
Terminal Radio Corp.
Tricraft Products Corp.

CHECKERS, CRYSTAL RECTIFIER

Airborne Instruments Lab., Inc.
Hi-Lo Manufacturing Corp.
Munston Mfg. & Service, Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Terminal Radio Corp.
Tricraft Products Corp.

CHECKERS, KLYSTRON TUBE

Hoover Electronics Co.
Ryan Aeronautical Co.
Terminal Radio Corp.

CHOKES

Aerolite Electronics Corp.
Airtron, Inc.
American Research & Mfg. Corp.
J. H. Bunnell & Co.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
E. F. Johnson Co.
Magnetico, Inc.
Munston Mfg. & Service, Inc.
National Coil Co.
Saratoga Industries
Sterling Transformer Corp.
Tele-Coil Co.
Transformers, Inc.
Transonic, Inc.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

CHROMATOGRAPHS, VAPOR PHASE

Consolidated Electrodynamics Corp.
Hallikainen Instruments
Leeds & Northrup Co.
Perkin-Elmer Corp.

CHRONOGRAPHS

Electro-Medical Lab., Inc.
Hamilton Watch Co., Military Products Div.

CHRONOMETERS

Consolidated Avionics Corp.
Hamilton Watch Co., Military Products Div.

CIRCUITS

Advance Industries, Inc.
Alden Products Co.
BJ Electronics, Borg-Warner Corp.
Burroughs Corp.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Electronic Associates, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ferranti Electric Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Librascope Inc.
Mica Corp.
NYT Electronics, Inc.
Potter Instrument Co., Inc.
Precision Circuits, Inc.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Skiatron Electronics & Television Corp.
Star Engraving Co., Ltd.
Topper Mfg. Co., Inc.
Zenith Optical Laboratory

Computer Logic

Autonetics, Div.-North American Aviation, Inc.
Bendix Aviation Corp., York Div.
Briggs Associates, Inc.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Computer Control Co., Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Epsco Inc.
Feedback Controls, Inc.
Ferranti Electric Inc.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
Kin Tel Div.-Cohu Electronics, Inc.
La Pointe Industries Inc.
Librascope Inc.
Potter Instrument Co., Inc.
Precision Circuits, Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Walkirt Co.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Zenith Optical Laboratory

Computer, Packaged

Advance Industries, Inc.
Alden Products Co.
Autonetics, Div.-North American Aviation, Inc.
Burroughs Corp.
Burrough Corp., Electronic Tube Div.
Cleveland Metal Specialties Co.
Computer Control Co., Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Eaton Electronics Corp.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Epsco Inc.
Erie Resistor Corp.
Feedback Controls, Inc.
Ferranti Electric Inc.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
La Pointe Industries Inc.
Librascope Inc.
Methode Mfg. Corp.
Precision Circuits, Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Topper Mfg. Co., Inc.
Walkirt Co.

Plated

Burroughs Corp.
Corning Glass Works
Dale Products, Inc.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eaton Electronics Corp.
Electra-Lab Inc.
Electronic Techniques, Inc.
Haller Raymond & Brown Inc.
La Pointe Industries Inc.
Librascope Inc.
Litton Industries, Component Div.
Methode Mfg. Corp.
Mica Corp.
Precision Circuits, Inc.
Printed Electronics Corp.
Skiatron Electronics & Television Corp.
Star Engraving Co., Ltd.

Plug-In

Advance Industries, Inc.
Alden Products Co.
Arthur Ansley Mfg. Co.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Burroughs Corp.
Computer Control Co., Inc.
Consolidated Avionics Corp.
Dale Products, Inc.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eaton Electronics Corp.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Electronic Processes Corp. of California
Electronic Techniques, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Kin Tel Div.-Cohu Electronics, Inc.
La Pointe Industries Inc.
Librascope Inc.
Litton Industries, Components Div.
Lytle Engrg. & Mfg. Co.
Methode Mfg. Corp.
NYT Electronics, Inc.
Ralph M. Parsons Co., The, Electronics Div.
Precision Circuits, Inc.
Printed Electronics Corp.
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Topper Mfg. Co., Inc.
Walkirt Co.
Telectro Industries Corp.
Transvision, Inc.
Tri-Dex Co.
Tur-Bo Jet Products Co., Inc.
Vanguard Electronics Co.
Varo Mfg. Co.
Waldom Electronics Inc.
Warren Transformer Co., Inc.
Western Coil Products Co.
Winatic Corp., The
Winder Aircraft Corp. of Fla.
Wright Zimmerman, Inc.

CLAMPS, HARNESS

Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Capewell Mfg. Co.
Cole-Hersee Co.
Dumont Aviation Associates
G. M. Dykes Iron Works, Inc.
Electric Auto-Lite Co., The
Elm Mfg. Co. Inc.
Hallett Mfg. Co.
Kickhaefer Mfg. Co.
Progressive Research & Development Co., Inc.
Skytronics
TA Mfg. Corp.
United-Carr Fastener Corp.
Weckesser Co.
Winder Aircraft Corp. of Fla.

CLIPS, ALLIGATOR

Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Birnbach Radio Co., Inc.
Cole-Hersee Co.
Mueller Electric Co.

CLIPS, CRYSTAL DIODE

Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Atlas E-E Corp.
Hobson Brothers, Inc.
Keystone Electronics Corp.

CLOCKS, TIME

*A. W. HAYDON CO., THE
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Wakmann Watch Co. Inc.

COIL ASSEMBLIES

Ace Coil & Electronics Co.
Aerolite Electronics Corp.
American Research & Mfg. Corp.
Bradford Components, Inc.
J. H. Bunnell & Co.
Caddell-Burns Mfg. Co. Inc.
Dwyer Engrg. Co., Inc.
Electro Engrg. Works
Epco Products Inc.
General Railway Signal Co.
Hallett Mfg. Co.
Hindle Transformer Co. Inc.
E. F. Johnson Co.
*KAHN & CO., INC.
Mar Vista Engrg. Co.
J. W. Miller Co.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Precision, Inc.
Redman Electronics Corp.
Rowe Industries
Saratoga Industries
Sioux Radio Products
Standard Electromagnetics, Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.

COILS

Ace Coil & Electronics Co.
Advance Industries, Inc.
Aerolite Electronics Corp.
American Research & Mfg. Corp.
Bradford Components, Inc.
J. H. Bunnell & Co.
Caddell-Burns Mfg. Co. Inc.
Cycle Transformer Corp.
Electrical Windings, Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Epco Products Inc.
General Railway Signal Co.
Hindle Transformer Co. Inc.
Illumitronic Engrg. Co.
E. F. Johnson Co.
Magnetico, Inc.
Mar Vista Engrg. Co.
Mara Electronics, Inc.
Microtran Co. Inc.
J. W. Miller Co.
Modelectric Products Corp.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Potter Aeronautical Corp.
Precision, Inc.
Radio Industries, Inc.
Redman Electronics Corp.
Saratoga Industries
Sioux Radio Products
Standard Electromagnetics, Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Tele-Coil Co.
Trane Co., The
Tri-Dex Co.
Tur-Bo Jet Products Co., Inc.
Vanguard Electronics Co.
Varo Mfg. Co.
Waldom Electronics Inc.
Warren Transformer Co., Inc.
Western Coil Products Co.
Winatic Corp., The

COLLECTOR RINGS

Airflyte Electronics Co.
Amplex Div.-Chrysler Corp.
Electro Tec Corp.
Electro Tec Corp., Virginia Div.
Electro-Miniatures Corp.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Gibson Electric Co.
*GRAPHITE METALLIZING CORP.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Poly-Scientific Corp.
*SLIP RING CO. OF AMERICA
Superior Carbon Products, Inc.
Tricon Mfg. Co.
Uniwave, Inc.

COMMUNICATIONS SYSTEMS

Alden Electronic & Impulse Recording Equip. Co.
Bliss Electronic Corp.
*DATA-CONTROL SYSTEMS INC.
Edgerton, Germeshausen & Grier, Inc.
Electronic Communications, Inc.
Executone, Inc.
General Railway Signal Co.
Hogan Laboratories, Inc.
Lane Electronics Mfg. Corp.
Lenkurt Electric Co., Inc.
Motorola Inc., Military Marketing Div.
North Electric Co.
Resdel Engrg. Corp.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

COMMUTATORS, SWITCHING

Airflyte Electronics Co.
Arnoux Corp.
Burroughs Corp., Electronic Tube Div.
Computer Instruments Corp.
*DATA-CONTROL SYSTEMS INC.
Electro Tec Corp.
Electro Tec Corp., Virginia Div.
Electro-Miniatures Corp.

. . . tracking & telemetering

Instrument Development Laboratories, Inc.
La Pointe Industries Inc.
Librascope Inc.
Mycalex Corp. of America
Pacific Div.-Bendix Aviation Corp.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
***SLIP RING CO. OF AMERICA**
Talley Corp., The
Telechrome Mfg. Corp.
Telectro Industries Corp.
Winder Aircraft Corp. of Fla.

COMPARATORS

Aeronca Mfg. Corp.
American Research & Mfg. Corp.
Baird-Atomic, Inc.
Barnes Development Co.
Bendix Aviation Corp., York Div
Brush Instruments, Div.-Clevite Corp.
Cleveland Instrument Co.
Consolidated Avionics Corp.
***COOPER DEVELOPMENT CORP.**
Davenport Mfg. Co.
Dwyer Engrg. Co., Inc.
Dynac, Inc.
Gertsch Products Inc.
Jones & Lamson Machine Co.
Optimized Devices, Inc.
Perkin-Elmer Corp.
Reeves Instrument Corp.
Telectro Industries Corp.
Varo Mfg. Co.

Automatic Resistance

Barnes Development Co.
California Technical Industries, Div.-Textron Inc.
Data Instruments, Div.-Telecomputing Corp.
Non-Linear Systems Inc.
Optimized Devices, Inc.
Ryan Aeronautical Co.
Telectro Industries Corp.

Capacitance

Barnes Development Co.
Boonton Electronics Corp.
California Technical Industries, Div.-Textron Inc.
Telectro Industries Corp.
Transformers, Inc.

Circuit Linearity

California Technical Industries, Div.-Textron Inc.
Gertsch Products Inc.
Telectro Industries Corp.

Dielectric

Telectro Industries Corp.

Iron Core

Magnetic Core Corp.
Telectro Industries Corp.

Q

Telectro Industries Corp.

Voltage

American Research & Mfg. Corp.
California Technical Industries, Div.-Textron Inc.
Consolidated Avionics Corp.
***COOPER DEVELOPMENT CORP.**
Davenport Mfg. Co.
Dwyer Engrg. Co., Inc.
Dynac, Inc.
John Fluke Mfg. Co., Inc.
North Atlantic Industries, Inc.
Non-Linear Systems Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.

COMPASSES

Eclipse-Pioneer Div., Bendix Aviation Corp.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Lear, Inc.
Librascope Inc.
Perkin-Elmer Corp.

COMPUTER INPUT EQUIPMENT

Alwac Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Bendix Aviation Corp., York Div.
Bendix Computer, Div.-Bendix Aviation Corp.
Benson-Lehner Corp.
Burroughs Corp.
Chicago Div.-American Bosch Arma Corp.
Coleman Engrg. Co., Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
James Cunningham Son & Co., Inc.
Dynac, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Ferranti Electric Inc.
Fischer & Porter Co.
Industrial Control Co.
Kearfott Co., Inc.
Librascope Inc.
Mechanical Div.-General Mills, Inc.
F. L. Moseley Co.
Potter Instrument Co., Inc.
***RADIATION, INC.**
Reeves Instrument Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Thompson-Ramo-Wooldrige Products Co., The
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

COMPUTER OUTPUT EQUIPMENT

Alwac Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Bendix Aviation Corp., York Div.
Bendix Computer, Div.-Bendix Aviation Corp.
Benson-Lehner Corp.
Burroughs Corp.
Chicago Div., American Bosch Arma Corp.
Consolidated Avionics Corp.
James Cunningham Son & Co., Inc.
Dynac, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Associates, Inc.
Electronic Engrg. Co. of California
Fischer & Porter Co.
Industrial Control Co.
Kearfott Co., Inc.
Librascope Inc.
Mechanical Div.-General Mills, Inc.
Milman Engrg. Co.
F. L. Moseley Co.
Non-Linear Systems Inc.
Potter Instrument Co., Inc.
***RADIATION, INC.**
Reeves Instrument Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

COMPUTERS

Advance Industries, Inc.
Allegany Instrument Co., Inc.
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Bendix Aviation Corp., York Div.
Benson-Lehner Corp.
CDC Control Services, Inc.
Consolidated Avionics Corp.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
Ferranti Electric Inc.
George F. Forbes, Industrial Mathematician, Publisher
GPS Instrument Co., Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Controls Co.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
***WALLACE O. LEONARD, INC.**
Librascope Inc.
Mechanical Div.-General Mills, Inc.
Mid-Century Instrumatic Corp.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Reeves Instrument Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Thompson-Ramo-Wooldridge Products Co., The
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Air Data

American Electronics, Inc., Data-Tronics Div.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Bowmar Instrument Corp.
CDC Control Services, Inc.
Consolidated Avionics Corp.
Consolidated Controls Corp.
***DATA-CONTROL SYSTEMS INC.**
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Feedback Controls, Inc.
George F. Forbes, Industrial Mathematician, Publisher
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Controls Co.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
***WALLACE O. LEONARD, INC.**
Librascope Inc.
Lytle Engrg. & Mfg. Co.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Nuclear Products-Erco, Dvi.-ACF Industries, Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
M. Ten Bosch, Inc.
United Control Corp.

Analog

Advance Industries, Inc.
Allegany Instrument Co., Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Bendix Computer, Div.-Bendix Aviation Corp.
Bowmar Instrument Corp.
Briggs Associates, Inc.
CDC Control Services, Inc.
Chadwick-Helmuth Co.
Daystrom Instrument Div., Daystrom, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electro-Mec Lab., Inc.
Electronic Associates, Inc.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Feedback Controls, Inc.
George F. Forbes, Industrial Mathematician, Publisher
GPS Instrument Co., Inc.
General Controls Co.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Industrial Control Co.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
***WALLACE O. LEONARD, INC.**
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Mid-Century Instrumatic Corp.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
George A. Philbrick Researches, Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Stromberg-Carlson, Electronics Div.
Technical Oil Tool Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Course Line

Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Bowmar Instrument Corp.
CDC Control Services, Inc.
Collins Radio Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
George F. Forbes, Industrial Mathematician, Publisher
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Mid-Century Instrumatic Corp.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.

Data Processing

American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Bendix Aviation Corp., York Div.
Benson-Lehner Corp.
Bowmar Instrument Corp.
Briggs Associates, Inc.
Burroughs Corp.
CDC Control Services, Inc.
Collins Radio Co.
Computer Control Co., Inc.
Consolidated Avionics Corp.

***DATA-CONTROL SYSTEMS INC.**
Electronic Associates, Inc.
Electronic Communications, Inc.
Electronic Engrg. Co. of California
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Epsco Inc.
Ferranti Electric Inc.
Fischer & Porter Co.
General Railway Signal Co.
Hallamore Electronics Co.
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Laboratory for Electronics, Inc.
***WALLACE O. LEONARD, INC.**
Librascope Inc.
Philco Corp., Government & Industrial Divs.
Radiation Counter Labs., Inc.
Reeves Instrument Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronics Systems, Div.-Sylvania Electric Products Inc.
Thompson-Ramo-Wooldridge Products Co., The
Telectro Industries Corp.

Digital

Advance Industries, Inc.
Alwac Corp.
American Electronics, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Bendix Aviation Corp., York Div.
Bendix Computer, Div.-Bendix Aviation Corp.
Benson-Lehner Corp.
Briggs Associates, Inc.
Burroughs Corp.
CDC Control Services, Inc.
Computer Control Co., Inc.
Consolidated Avionics Corp.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electrodata Div.-Burroughs Corp.
Electronic Engrg. Co. of California
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Ferranti Electric Inc.
George F. Forbes, Industrial Mathematician, Publisher
Haller Raymond & Brown Inc.
Hoffman Electronics Corp., Semiconductor Div.
Hoover Electronics Co.
Kearfott Co., Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Laboratory for Electronics, Inc.
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Philco Corp., Geovernment & Industrial Divs.
Reeves Instrument Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Thompson Products, Inc.
Thompson-Ramo-Wooldridge Products Co., The
Wayne-George Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Navigation

Advance Industries, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Analogue Controls, Inc.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Bowmar Instrument Corp.
Burroughs Corp.
CDC Control Services, Inc.
Collins Radio Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Emeloid Co. Inc., The
George F. Forbes, Industrial Mathematician, Publisher
Haller Raymond & Brown Inc.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Laboratory for Electronics, Inc.
Librascope Inc.
W. L. Maxson Corp., The
Mechanical Div.-General Mills, Inc.
Nuclear Products-Erco, Div.-ACF Industries, Inc.
Philco Corp., Government & Industrial Divs.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Storage

***AMERICAN MACHINE & FOUNDRY CO.**
Autonetics, Div.-North American Aviation, Inc.
CDC Control Services, Inc.
Computer Control Co., Inc.
Haller Raymond & Brown Inc.
Laboratory for Electronics, Inc.
Librascope Inc.
Miljan Div., Paul Omohundro Co.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

CONES, SPEAKER

Cal-Ohm Labs., Inc.
A. C. Dudek & Co.
Magnavox Co., The
Mendelsohn Speedgun Co., Inc.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Stevens Products, Inc.
Telectro Industries Corp.
Waldom Electronics Inc.

CONNECTORS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Alden Products Co.
***ANTON ELECTRONIC LABS., INC.**
Avnet Corp.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Cannon Electric Co.
Capewell Mfg. Co.
Circon Component Corp.
Connector Corp. of America
Dage Electric Co., Inc.
Elco Corp.
Electronic Techniques, Inc.
Enflo Corp.
Garde Mfg. Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General R-F Fittings, Inc.
Hobson Brothers, Inc.
E. F. Johnson Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kasar Mfg. & Distributing Co., Inc.
Litton Industries, Components Div.
Malco Tool & Mfg. Co.
Methode Mfg. Corp.
Frank W. Morse Co.
Pyle-National Co., The
***HAROLD H. POWELL CO.**
Richards Electrocraft, Inc.
Scintilla Div., Bendix Aviation Corp.
Titeflex, Inc.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
U. S. Component Inc.
Western International Co.
Winchester Electronics, Inc.

CONTROLS

Advanced Products Co., The
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Burroughs Corp.
Cameraflex Corp.
Cutler-Hammer Inc.
Daven Co., The
Davenport Mfg. Co.
***EASTERN INDUSTRIES, INC.**
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
***A. W. HAYDON CO., THE**
Industrial Electronic Engineers
Leeds & Northrup Co.
Librascope Inc.
Republic Aviation Corp., Guided Missiles Div.
Servomechanisms, Inc.
Tensor Electric Development Co., Inc.
Thompson-Ramo Woolridge Products Co., The
Varo Mfg. Co.

Audio Recording

Daven Co., The
Dunlap Electronics, Inc.
P. R. Mallory & Co. Inc.
J. A. Maurer, Inc.
Varo Mfg. Co.

Automatic Approach

Autonetics, Div.-North American Aviation, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Reeves Instrument Corp.
Tensor Electric Development Co., Inc.

Broadcast Input

Daven Co., The
Dunlap Electronics, Inc.

Camera

Abrams Instrument Corp.
Cameraflex Corp.
Dunlap Electronics, Inc.
Edgerton, Germeshausen & Grier, Inc.
J. W. Fecker, Inc. Sub.-American Optical Co.
***HAYWARD SCIENTIFIC GLASS CORP.**
Houston Fearless Corp.
Librascope Inc.
J. A. Maurer, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Traid Corp.

Camera, Remote

Abrams Instrument Corp.
Cameraflex Corp.
Edgerton, Germeshausen & Grier, Inc.
Houston Fearless Corp.
J. W. Fecker Inc. Sub.-American Optical Co.
J. A. Maurer, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Traid Corp.

Capacitance Operated

Aeronautical & Instrument Div., Robertshaw-Fulton Controls Co.
Liquidometer Corp., The

Computer

Autonetics, Div.-North American Aviation, Inc.
Benson-Lehner Corp.
Briggs Associates, Inc.
Burroughs Corp.
CDC Control Services, Inc.
Consolidated Avionics Corp.
Daven Co., The
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Associates, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Kearfott Co., Inc.
Librascope Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Thompson-Ramo-Wooldridge Products Co., The

Counting & Sorting

Baird-Atomic, Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Electric Eye Equipment Co.
Electro Products Labs., Inc.
Industrial Electronic Engineers
Librascope Inc.
Mast Development Co., Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Potter Instrument Co., Inc.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.

Electronic AC Motor Speed

Advanced Products Co., The
American Research & Mfg. Corp.
Cutler-Hammer Inc.
Davenport Mfg. Co.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Reeves Instrument Corp.
Varo Mfg. Co.
Wacline, Inc.

Loop Regulation

CDC Control Services, Inc.
Reeves Instrument Corp.
Varo Mfg. Co.

Master

CDC Control Services, Inc.
Cutler-Hammer Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Thompson-Ramo-Wooldridge Co., The

Ph

CDC Control Services, Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.

Photographic Exposure

Cameraflex Corp.
Edgerton, Germeshausen & Grier, Inc.
J. W. Fecker Inc. Sub.—American Optical Co.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Traid Corp.
Specialties, Inc.

Photoelectric

Autotron, Inc.
Edgerton, Germeshausen & Grier, Inc.

. . . tracking & telemetering

Electric Eye Equipment Co.
Electron-Radar Products
Hoffman Electronics Corp., Semiconductor Div.
J. W. Fecker Inc. Sub.—American Optical Co.
General Electric Co., Apparatus Sales Div.
Intercontinental Dynamics Corp.
Mast Development Co., Inc.
J. A. Maurer, Inc.

Voltage Regulator

Abrams Instrument Corp.
American Research & Mfg. Corp.
Bendix Aviation Corp., Red Bank Div.
Engineered Magnetics, Div.-Gulton Industries, Inc.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Ferranti Electric Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
E. Vernon Hill & Co.
Hoffman Electronics Corp., Semiconductor Div.
Lumen, Inc.
Mercury Electronic Co.
Reeves Instrument Corp.
Superior Electric Co., The
Tel-Instrument Electronics Corp.
Wacline, Inc.

Volume

Clarostat Mfg. Co., Inc.
Cutler-Hammer Inc.
Daven Co., The
P. R. Mallory & Co. Inc.
Simmonds Aerocessories, Inc.

CONVERTERS

Advance Industries, Inc.
Aeronca Mfg. Corp.
Airborne Accesories Corp.
Alto Scientific Co., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Applied Research Inc.
Assembly Products, Inc.
Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
Data Instruments, Div.-Telecomputing Corp.
Datex Div., G. M. Giannini & Co., Inc.
Dynac, Inc.
Electronic Associates, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Electrosolids Corp.
Fischer & Porter Co.
Industrial Control Co.
*INTERELECTRONICS CORP.
Kearfott Co., Inc.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Magnavox Co., The
J. A. Maurer, Inc.
George L. Nankervis Co.
Redmond Co., Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Tally Register Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Co., The
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wincharger Corp.

Analog Digital

Advance Industries, Inc.
Airflyte Electronics Co.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
*AMERICAN MACHINE & FOUNDRY CO.
Assembly Products, Inc.
Austin Co., The, Special Devices Div.
Baird-Atomic, Inc.
Benson-Lehner Corp.
Centronix Inc.
Coleman Engrg. Co., Inc.
Computer Control Co., Inc.
Consolidated Controls Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
James Cunningham Son & Co., Inc.
Data Instruments, Div.-Telecomputing Corp.
Datex Div., G. M. Giannini & Co., Inc.
Dynac, Inc.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Electronics Corp. of America
Epsco Inc.
Fischer & Porter Co.
Hoover Electronics Co.
Instrument Development Laboratories, Inc.
Kearfott Co., Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Magnavox Co., The
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Moran Instrument Corp.
George L. Nankervis Co.
Non-Linear Systems Inc.
*RADIATION, INC.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Streeter-Amet Co.
Systron Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
Wayne-George Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

Electric

Airborne Accessories Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Bogue Electric Mfg. Co.
Georator Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Gerard G. Leeds Co., Inc.
*RADIATION, INC.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Tel-Instrument Electronics Corp.
Telkor, Inc.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Wincharger Corp.

Field Sequential

Bell & Gossett Co.
Skiatron Electronics & Television Corp.

Microwave

Aircom Inc.
Canoga Corp. of California
Demornay-Bonardi
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
J-V-M Microwave Co.
Uniwave, Inc.

R-F

Applied Research Inc.
Blonder-Tongue Labs., Inc.
Hallamore Electronics Co.
J-V-M Microwave Co.

Rotary

Bogue Electric Mfg. Co.
D & R, Ltd.
General Electric Co., Apparatus Sales Div.
Georator Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Redmond Co., Inc.
Sangamo Electric Co.
Varo Mfg. Co.

Voltage

Alto Scientific Co., Inc.
Arnoux Corp.
Bendix Aviation Corp., Red Bank Div.
Engineered Magnetics, Div.-Gulton Industries, Inc.
Hallamore Electronics Co.
General Electric Co., Apparatus Sales Div.
Hertner Electric Co., The
*INTERELECTRONICS CORP.
Jordan Electronics, Div.-Victoreen Instrument Co.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Power Sources, Inc.
Reeves Instrument Corp.
Sangamo Electric Co.
Southwestern Industrial Electronics Co.
United Electrodynamics, Div.-United Geophysical Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.

Waveform

Electronic Instrumentation Co., Div.-Ramo-Wooldridge Corp.
*INTERELECTRONICS CORP.
Power Sources, Inc.
Varo Mfg. Co.

COOLING SYSTEMS, ELECTRONIC

Calcor Corp., Aircraft Div.
Dunham-Bush Inc.
*EASTERN INDUSTRIES, INC.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Electronic Techniques, Inc.
Ellis & Watts Products, Inc.
G. W. Galloway Co.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
*KAHN & CO., INC.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
South Wind Div., Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Task Corp.
Telechrome Mfg. Corp.
Trane Co., The
*UNITED AIRCRAFT PRODUCTS, INC.

COPPER LAMINATES, PRINTED CIRCUIT

Cleveland Graphite Bronze Co., Div.-Clevite Corp.
Dwyer Engrg. Co., Inc.
Illumitronic Engrg. Co.
La Pointe Industries Inc.
Naz-Dar Co.
New England Laminates Co., Inc.
St. Regis Paper Co.
Sohl Co., The
Swedlow Plastics Co.
Techniques, Inc.

CORES

Advance Industries, Inc.
Allied Plastics Supply Corp.
Arnold Engrg. Co., The
Indiana Steel Products Co., Inc.
Radio Cores, Inc.
D. M. Steward Mfg. Co.

C Type

Arnold Engrg. Co., The
Barker Sales Co.
Indiana Steel Products Co., Inc.
D. M. Steward Mfg. Co.

Ceramic

Arnold Engrg. Co., The
Auburn Spark Plug Co., Inc.
Electric Auto-Lite Co., The
General Ceramics Corp.
Isolantite Mfg. Corp.
Lapp Insulator Co., Inc., Radio Specialties Div.
D. M. Steward Mfg. Co.
Superex Electronics Corp.

Cut

Arnold Engrg. Co., The

E Type

Arnold Engrg. Co., The
D. M. Steward Mfg. Co.

Ferrite

Airtron, Inc.
Arnold Engrg. Co., The
General Cermamics Corp.
Kearfott Co., Inc.
D. M. Steward Mfg. Co.
Superex Electronics Corp.
Thermo Materials, Inc.

High Permeability Magnetic

Advance Industries, Inc.
Arnold Engrg. Co., The
G-L Electronics Co., Inc.
Radio Cores, Inc.
D. M. Steward Mfg. Co.

Iron

Arnold Engrg. Co., The
Custom Components, Inc.
Radio Cores, Inc.

Laminated

Allied Plastics Supply Corp.
Arnold Engrg. Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.

Powdered

Amplex Div.-Chrysler Corp.
Arnold Engrg. Co., The
Custom Components, Inc.
Radio Cores, Inc.
Superex Electronics Corp.
Superior Carbon Products, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Slug Tuning Units

Arnold Engrg. Co., The
Custom Componnts, Inc.
Radio Cores, Inc.
D. M. Steward Mfg. Co.

Tape Wound

Arnold Engrg. Co., The
Barker Sales Co.
G-L Electronics Co., Inc.
Nemeth, Inc.

COUNTING DEVICES

Abrams Instrument Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Autotron, Inc.
Baird-Atomic, Inc.
Burroughs Corp., Electronic Tube Div.
Coleman Engrg. Co., Inc.
Computer-Measurements Corp.
Consolidated Avionics Corp.
Digitran Co., The
Dunlap Electronics, Inc.
Durant Mfg. Co.
Dynac, Inc.
Electric Auto-Lite Co., The
Electric Eye Equipment Co.
Electro Products Labs., Inc.
Electronics Corp. of America
Electro-Tech Equipment Co.
Erie Resistor Corp.
Exact Engrg. & Mfg. Inc.
General Controls Co.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hamner Electronics Co., Inc.
Hupp Instrumation, Div.-Erie-Pacific
Kearfott Co., Inc.
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Mast Development Co., Inc.
Optomechanisms Inc.
Photocon Research Products
Potter Aeronautical Corp.
Potter Instrument Co., Inc.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Stanley Aviation Corp.
Telectro Industries Corp.
Veeder-Root Inc.
Victor Adding Machine Co.
Wacline, Inc.
Walkirt Co.

COUPLERS, DIRECTIONAL, MICROWAVE

Aircom Inc.
Bogart Mfg. Corp.
***COOPER DEVELOPMENT CORP.**
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Haller Raymond & Brown Inc.
Hoover Electronics Co.
Kearfott Co., Inc.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Omega Labs., Inc.
Radar Design Corp.
Sage Laboratries, Inc.
Saratoga Industries
Technical Appliance Corp.
Technical Oil Tool Corp.
***TELERAD MFG. CORP.**
Uniwave, Inc.
Waveline, Inc.
Westbury Electronics Inc.

COUPLERS, TRANSMITTER

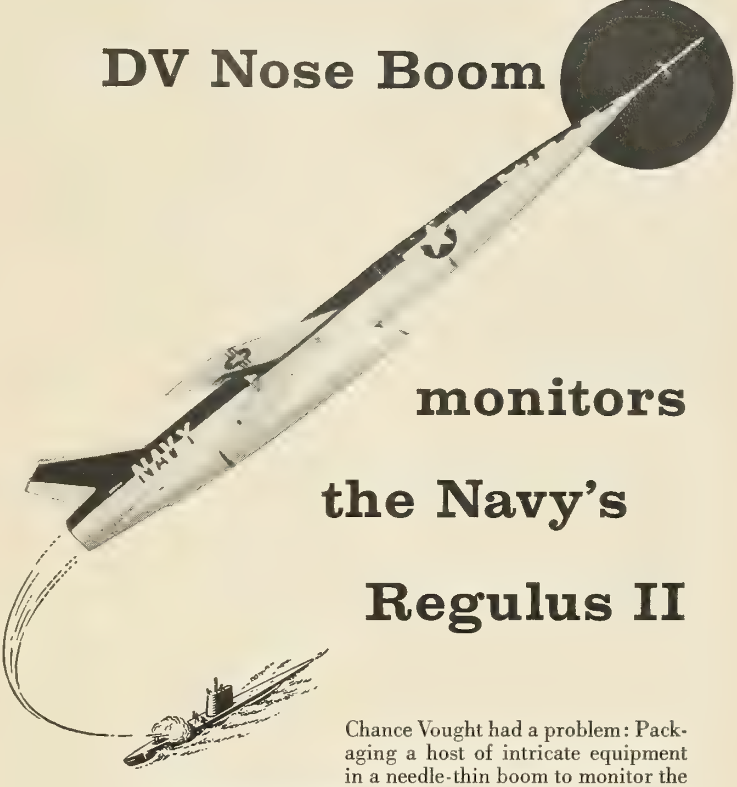
Amelco, Inc.
Diamond Antenna & Microwave Corp.
Haller Raymond & Brown Inc.

COUPLING & PHASING UNITS

Coaxial Connector Co. Inc.
Diamond Antenna & Microwave Corp.
Haller Raymond & Brown Inc.
Prodelin Inc.
Technical Appliance Corp.

COUPLINGS, MICROWAVE

Aircom Inc.
Coaxial Connector Co. Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
***GRAPHITE METALLIZING CORP.**
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Microwave Electronics Div., Sperry Gyroscope Co.



Another **DALMO VICTOR** *achievement*

Super-sensitive DV Nose Boom monitors the Navy's Regulus II

Chance Vought had a problem: Packaging a host of intricate equipment in a needle-thin boom to monitor the Navy's new guided missile, Regulus II. This "packaging" was additionally complicated by the requirement that to conserve storage space on board a submarine, the boom must fold pneumatically by remote control.

Dalmo Victor's engineering skill, acquired through development of airborne radar scanner designs, provided the answer!

The ten-foot DV pitot static boom, as accepted by the Navy, meets these most exacting design requirements and provides vital data, including airspeed and altitude, as well as angles of attack and yaw.

Long-recognized leader in airborne radar antennas, Dalmo Victor now applies its experience and skills to create missile components. Contact the nearest DV office for help in solving similar problems.

DV

DALMO VICTOR COMPANY
Division of Textron Inc.
BELMONT, CALIFORNIA
SALES: Dayton, Los Angeles, Washington
FIELD SERVICE: Baltimore, Belmont

. . . tracking & telemetering

Narda Microwave Corp., The
Omega Labs., Inc.
Pic Design Corp., Sub-Benrus Watch Co., Inc.
Radar Design Corp.
Technical Appliance Corp.
Technical Oil Tool Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.
Waveline, Inc.
Waveguide, Inc.
Westbury Electronics Inc.

CRYSTAL CARTRIDGES

Elm Mfg. Co. Inc.
Magnavox Co., The
Shure Brothers, Inc.

CRYSTAL FILTERS

American Electronic Labs., Inc.
Bliley Electric Co.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Diamond Antenna & Microwave Corp.
Hycon Eastern Inc.
James Knights Co., The
McCoy Electronics Co.
August E. Miller Laboratories
Reeves-Hoffman Div.
Wright Electronics Inc.

CRYSTAL MOUNTS

American Electronic Labs., Inc.
L. L. Constantin & Co.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Elm Mfg. Co. Inc.
Enflo Corp.
McCoy Electronics Co.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Radar Design Corp.
Reeves-Hoffman Div.
Sage Laboratories, Inc.
Tensor Electric Development Co., Inc.
Wacline, Inc.
Waveline, Inc.

CRYSTAL SOCKETS

Bulova Watch Co., Electronics Div.
Elco Corp.
McCoy Electronics Co.
August E. Miller Laboratories
Reeves-Hoffman Div.
Tensor Electric Development Co., Inc.
Waldom Electronics Inc.

CRYSTALS

Bliley Electric Co.
Bulova Watch Co., Electronics Div.
Eidson Electronic Co.
James Knights Co., The
McCoy Electronics Co.
Midland Mfg. Co., Inc.
August E. Miller Laboratories
Motorola Inc., Military Marketing Div.
Premier Research Laboratories, Inc.
Reeves-Hoffman Div.
Tensor Electric Development Co., Inc.
Wright Electronics Inc.

CUTOUTS

Kolton Electric Mfg. Co.

DATA

Alden Electronic & Impulse Recording Equip. Co.
Allegany Instrument Co., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Analogue Controls, Inc.
Arnoux Corp.
BJ Electronics, Borg-Warner Corp.
Benson-Lehner Corp.
Burroughs Corp.
Cameraflex Corp.
Century Electronics & Instruments, Inc.
Coleman Engrg. Co., Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
Data Instruments, Div.-Telecomputing Corp.
Electronics Corp. of America
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
*FLIGHT RESEARCH, INC.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Lear, Inc., Grand Rapids Div.
Librascope Inc.
Maico Electronics, Inc.
Perkin-Elmer Corp.
*RADIATION, INC.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

Recorders, Analog

Alden Electronic & Impulse Recording Equip. Co.
Allegany Instrument Co., Inc.
American Electronics, Inc.
Aermican Electronics, Inc., Data-Tronics Div.
*AMERICAN MACHINE & FOUNDRY CO.
Analogue Controls, Inc.
Antlab Inc.
Arnoux Corp.
Austin Co., The, Special Devices Div.
Autonetics, Div.-North American Aviation, Inc.
Baird-Atomic, Inc.
Bendix Computer, Div.-Bendix Aviation Corp.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Coleman Engrg. Co., Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
James Cunningham Son & Co., Inc.
Curtiss-Wright Corp., Electronics Div.
Data Instruments, Div.-Telecomputing Corp.
Electromation Co.
Electronic Associates, Inc.
Fenske Fedrick & Miller Co.
Fischer & Porter Co.
General Precision Lab. Inc.
Haller Raymond & Brown Inc.
Heiland Div.—Minneapolis-Honeywell
Hogan Laboratories, Inc.
Instruments Corp., The
Kinevox-Hallen
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Librascope Inc.
Magnasync Mfg. Co., Ltd.
Maico Electronics, Inc.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Northam Electronics, Inc.
Offner Electronics Inc.
Potter Aeronautical Corp.
*RADIATION, INC.
Reeves Instrument Corp.
Sanborn Co.
Skiatron Electronics & Television Corp.
Streeter-Amet Co.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

Recorders, Digital

Alden Electronic & Impulse Recording Equip. Co.
Allegany Instrument Co., Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
*AMERICAN MACHINE & FOUNDRY CO.
Analogue Controls, Inc.
Austin Co., The, Special Devices Div.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Bendix Computer, Div.-Bendix Aviation Corp.
Benson-Lehner Corp.
Burroughs Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Coleman Engrg. Co., Inc.
Computer-Measurements Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
James Cunningham Son & Co., Inc.
Data Instruments, Div.-Telecomputing Corp.
Datex Div., G. M. Giannini & Co., Inc.
Dynametrics Corp.
Electronic Associates, Inc.
Sherman Fairchild & Assoc. Inc.
Fischer & Porter Co.
General Precision Lab. Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hanson-Gorrill-Brian, Inc.
Hogan Laboratories, Inc.
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Librascope Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Non-Linear Systems Inc.
Northam Electronics, Inc.
Potter Aeronautical Corp.
Potter Instrument Co., Inc.
*RADIATION, INC.
Reeves Instrument Corp.
Research Appliance Co.
Scientific-Atlanta, Inc.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Streeter-Amet Co.
Tally Register Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

Recording Equipment

Alden Electronic & Impulse Recording Equip. Co.
Allegany Instrument Co., Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
*AMERICAN MACHINE & FOUNDRY CO.
Autonetics, Div.-North American Aviation, Inc.
B & F Instruments, Inc.
Baird-Atomic, Inc.
Barnes Development Co.
Benson-Lehner Corp.
Brush Instruments, Div.-Clevite Corp.
Cameraflex Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Coleman Engrg. Co., Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
Curtiss-Wright Corp., Electronics Div.
*DATA-CONTROL SYSTEMS INC.
Datex Div., G. M. Giannini & Co., Inc.
Edgerton, Germeshausen & Grier, Inc.
Electromation Co.
Electronic Associates, Inc.
Fischer & Porter Co.
*FLIGHT RESEARCH, INC.
General Precision Lab. Inc.
Haller Raymond & Brown Inc.
Hogan Laboratories, Inc.
Instruments Corp., The
Kinevox-Hallen
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Magnasync Mfg. Co., Ltd.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co.
F. L. Moseley Co.
Northam Electronics, Inc.
Offner Electronics Inc.
Optomechanisms Inc.
Perkin-Elmer Corp.
Potter Aeronautical Corp.
Potter Onstrument Co., Inc.
Traid Corp.
*RADIATION, INC.
Radiation Counter Labs., Inc.
Reeves Instrument Corp.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Research Appliance Co.
Sanborn Co.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Tally Register Corp.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The

DECADE BOXES

Aerolite Electronics Corp.
Barnes Development Co.
Clarostat Mfg. Co., Inc.
Cornell-Dubilier Electric Corp.
ECS Corp.
Electro-Tech Equipment Co.
Industrial Instruments Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
Telonic Industries, Inc.
United Transformer Corp.

DECODERS

Bendix Aviation Corp., York Div.
Burroughs Corp., Electronic Tube Div.
Collins Radio Co.
Dynac, Inc.
ECS Corp.
Edgerton, Germeshausen & Grier, Inc.
Fenske Fedrick & Miller Co.
General Railway Signal Co.
Hamilton Watch Co., Military Products Div.
Industrial Electronic Engineers
Munston Mfg. & Service, Inc.
Orbitran Co., Inc.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Skiatron Electronics & Television Corp.
Stewart-Warner Corp.
Telectro Industries Corp.

DELAY LINES

Alden Products Co.
Andersen Laboratories, Inc.
Bliley Electric Co.
Richard D. Brew & Co., Inc.
Burnell & Co., Inc.
Celco-Constantine Engrg. Laboratories Co.
Computer Control Co., Inc.
Daven Co., The
Digitronics Corp.
ECS Corp.
Epsco Inc.
Ferranti Electric Inc.

Filtron Co., Inc.
Fugle-Miller Labs Inc.
Gudeman Co., The
North Atlantic Industries, Inc.
Laboratory for Electronics, Inc.
Librascope Inc.
NYT Elecronics, Inc.
Orbitran Co., Inc.
Redman Electronics Corp.
Southwestern Industrial Electronics Co.
Stewart-Warner Corp.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tobe Deutschmann Corp.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Electronics Co.

DELAY NETWORKS

Richard D. Brew & Co., Inc.
Burnell & Co., Inc.
Celco-Constantine Engrg. Laboratories Co.
Daven Co., The
ECS Corp.
Epsco Inc.
Ferranti Electric Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
NYT Electronics, Inc.
Orbitran Co., Inc.
Plastic Capacitors, Inc.
Technitrol Engrg. Co.
Tobe Deutschmann Corp.
Tucson Instrument Corp.
Vanguard Electronics Co.
United Transformer Corp.

DEMODULATORS, COMPUTER

American Electronics, Inc., Data-Tronics Div.
American Research & Mfg. Corp.
Celco-Constantine Engrg. Laboratories Co.
Consolidated Avionics Corp.
*DATA-CONTROL SYSTEMS INC.
Dwyer Engrg. Co., Inc.
Epsco Inc.
Reeves Instrument Corp.
Southwestern Industrial Electronics Co.

DETECTORS

Davenport Mfg. Co.
Electro-Measurements Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Leeds & Northrup Co.
Optimized Devices, Inc.
Terminal Radio Corp.

Magnetic

Acromag Inc.
General Electric Co., Apparatus Sales Div.
Terminal Radio Corp.

Null

Ballantine Labs., Inc.
Barnes Development Co.
Boonton Electronics Corp.
Electro-Measurements Inc.
Gertsch Products Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Optimized Devices, Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Weinschel Engrg.

Scintillation

American Electronics, Inc.
Baird-Atomic, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Fisher Research Lab., Inc.
Gerard G. Leeds Co., Inc.
Menlo Research Lab.
Moran Instrument Corp.
Radiation Counter Labs., Inc.
Stanley Aviation Corp.
Terminal Radio Corp.

Standing Wave

California Technical Industries, Div.-Textron Inc.
Demornay-Bonardi
Electro Impulse Lab., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Omega Labs., Inc.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Wacline, Inc.
Waveline, Inc.

Voltage

Boonton Electronics Corp.
*DATA-CONTROL SYSTEMS INC.
Davenport Mfg. Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.

Optimized Devices, Inc.
Terminal Radio Corp.
Wacline, Inc.

DIAL CRYSTALS

Canadian Radium & Uranium Corp.
Lancaster Glass Corp.
Spartan Marking Corp.
Star Engraving Co., Ltd.
Terminal Radio Corp.
Virginia Plak Co.

DIALS, COMPLETE

Ackerman Engravers, Inc.
Acromark Co., The
Allied Engraving & Stamping Co.
Borg Equipment Div.-The George W. Borg Corp.
Canadian Radium & Uranium Corp.
Helipot Corp.
Jodee Plastics Co.
E. F. Johnson Co.
Print Loid, Inc.
Reeves Instrument Corp.
Sohl Co., The
Spartan Marking Corp.
Star Engraving Co., Ltd.
Techniques, Inc.
Terminal Radio Corp.
Theta Instrument Corp.
United States Radium Corp.
Waldom Electronics Inc.

DIODES

Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
Clevite Transistor Products, Div.-Clevite Corp.
Fansteel Metallurgical Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Gahagan Inc.
General Transistor Corp.
Green Rectifier Co.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Crystal

Bios Labs., Inc.
Clevite Transistor Products, Div.-Clevite Corp.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Germanium

Bendix Aviation Corp., Red Bank Div.
Bios Labs., Inc.
Clevite Transistor Products, Div.-Clevite Corp.
Gahagan Inc.
General Transistor Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Microwave Mixer

Demornay-Bonardi
Gahagan Inc.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Silicon

Bios Labs., Inc.
Bogue Electric Mfg. Co.
Bomac Laboratories, Inc.
Clevite Transistor Products, Div.-Clevite Corp.
Fansteel Metallurgical Corp.
General Transistor Corp.
Green Rectifier Co.
Hoffman Electronics Corp., Semiconductor Div.
Philco Corp., Government & Industrial Divs.
Sarkes Tarzian, Inc.
Terminal Radio Corp.
United States Dynamics Corp.
*WESTINGHOUSE ELECTRIC CORP.

Silicon Power

Bios Labs., Inc.
Bogue Electric Mfg. Co.
Fansteel Metallurgical Corp.
General Transistor Corp.
Green Rectifier Co.
Hoffman Electronics Corp., Semiconductor Div.
Sarkes Tarzian, Inc.
*WESTINGHOUSE ELECTRIC CORP.

DISCRIMINATORS

Amelco, Inc.
American Electronics, Inc., Data-Tronics Div.
Baird-Atomic, Inc.
Bendix Aviation Corp., York Div.
Bomac Laboratories, Inc.
Burroughs Corp.
Centronix Inc.
D & R, Ltd.
*DATA-CONTROL SYSTEMS INC.
Dwyer Engrg. Co., Inc.
Epsco Inc.
Johnson Electronics Inc.
Librascope Inc.
Optimized Devices, Inc.
Pacific Div.-Bendix Aviation Corp.
Systron Corp.
Telechrome Mfg. Corp.
*TELE-DYNAMICS INC.
Thieblot Aviation Co., Div.-Vitro Corp. of America
Varo Mfg. Co.
Waugh Engrg. Co.

DISCS, COMPUTER

Bryant Gage & Spindle Div., Bryant Chucking Grinder Co.
Industrial Engravers Inc.
Librascope Inc.
Sohl Co., The
Virginia Plak Co.

DISTANCE MEASURING EQUIPMENT

Aircraft Armaments, Inc.
Centronix Inc.
Consolidated Avionics Corp.
*COOPER DEVELOPMENT CORP.
Cubic Corp.
General Precision Lab. Inc.
Industrial Engravers Inc.
Kearfott Co., Inc.
Ralph M. Parsons Co., The, Electronics Div.
Skiatron Electronics & Television Corp.
Stanley Aviation Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.

DRIFTMETERS

General Precision Lab. Inc.
*HAYWARD SCIENTIFIC GLASS CORP.

DRIVERS, RECORDING

Ralph M. Parsons Co., The, Electronics Div.
Southwestern Industrial Electronics Co.

DUPLEXERS

Bogart Mfg. Corp.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Microlab
Narda Microwave Corp., The
Radar Design Corp.
Ryan Aeronautical Co.
Uniwave, Inc.
Waveline, Inc.

DUPLICATORS, MAGNETIC TAPE

Magnasync Mfg. Co., Ltd.
Minneapolis-Honeywell Regulator Co., Industrial Div.
Telectro Industries Corp.

DYNAMOMETERS

Bogue Electric Mfg. Co.
Cosa Corp.
Joe Davidson & Associates
W. C. Dillon & Co., Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
George L. Nankervis Co.
Simpson Electric Co.

ELECTROCARDIOGRAPHS

Offner Electronics Inc.

FILMS, CAPACITOR

Dilectrix Corp.

FILMS, PLASTIC FOR WOUND INSULATION

Bonny Mfg. Corp.
Dilectrix Corp.
Enflo Corp.
Joclin Mfg. Co.
Sparta Mfg. Co.

FILTERS

Airborne Accessories Corp.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
American Optical Co., Instrument Div.
American Research & Mfg. Corp.
Applied Research Inc.
Bogart Mfg. Corp.
Burnell & Co., Inc.
Carad Corp.

Celco-Constantine Engrg. Laboratories Co.
Chicago Electronic Engrg. Co., Inc.
Cornell-Dubilier Electric Corp.
Cuno Engrg. Corp., The
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Dwyer Engrg. Co., Inc.
ECS Corp.
Electronic Transformer Co., Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Goslin Electric & Mfg. Co.
Gudeman Co., The
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Hycon Eastern Inc.
J-V-M Microwave Co.
Lear, Inc.
Lenkurt Electric Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Polarad Electronics Corp.
Ram Electronics Inc.
Republic Aviation Corp., Guided Missiles Div.
Sage Laboratories, Inc.
Southwestern Industrial Electronics Co.
Stewart-Warner Corp.
Superex Electronics Corp.
Televiso Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Waveguide, Inc.
Winder Aircraft Corp. of Fla.
Wollensak Optical Co.

Antenna

Adler Electronics, Inc.
Aircom Inc.
Alto Scientific Co., Inc.
American Electronic Labs., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Applied Research Inc.
Canoga Corp. of California
Collins Radio Co.
Daven Co., The
Defiance Engrg. & Microwave Corp.
Diamond Antenna & Microwave Corp.
Electronic Transformer Co., Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Gabriel Co., The Gabriel Electronics Div.
Hycon Eastern Inc.
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics Inc.
Lear, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
J. W. Miller Co.
Munston Mfg. & Service, Inc.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Ralph M. Parsons Co., The, Electronics Div.
Prodelin Inc.
Production Research Corp.
Supersex Electronics Corp.
Technical Appliance Corp.
Telectro Industries Corp.
Televiso Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

Audio

***BAUSCH & LOMB OPTICAL CO.**
Browning Laboratories, Inc.
Burnell & Co., Inc.
Celco-Constantine Engrg. Laboratories Co.
Chicago Electronic Engrg. Co., Inc.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Electronic Transformer Co., Inc.
Epco Products Inc.
Goslin Electric & Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Johnson Electronics Inc.
Lenkurt Electric Co., Inc.
Lumen, Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
Orbitran Co., Inc.
Ortho Filter Corp.
Potter Co., The
Prodelin Inc.
Saratoga Industries
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Televiso Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transformers, Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Western Electro-Acoustic Lab.

Band Elimination

Adler Electronics, Inc.
American Electronic Labs., Inc.
Applied Research Inc.
***BAUSCH & LOMB OPTICAL CO.**
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
D & R, Ltd.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Defiance Engrg. & Microwave Corp.
Epsco Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hycon Eastern Inc.
Johnson Electronics Inc.
Lenkurt Electric Co., Inc.
J. W. Miller Co.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Orbitran Co., Inc.
Ortho Filter Corp.
Potter Co., The
Prodelin Inc.
Ram Electronics Inc.
Sage Laboratories, Inc.
Saratoga Industries
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Televiso Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transformers, Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Westinghouse Electric Corp.

Band Pass

Adler Electronics, Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Applied Research Inc.
Bogart Mfg. Corp.
Browning Laboratories, Inc.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Chicago Electronic Engrg. Co., Inc.
Collins Radio Co.
Cornell-Dubilier Electric Corp.
D & R, Ltd.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
ECS Corp.
Electronic Transformer Co., Inc.
Entron, Inc.
Epsco Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Hycon Eastern Inc.
Johnson Electronics Inc.
Lenkurt Electric Co., Inc.
J. W. Miller Co.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Orbitran Co., Inc.
Ortho Filter Corp.
Potter Co., The
Ram Electronics Inc.
Sage Laboratories, Inc.
Saratoga Industries
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Televiso Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Electrodynamics, Div.-United Geophysical Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Western Coil Products Co.
Western Electro-Acoustic Lab.
Westinghouse Electric Corp.

Continuously Variable

American Electronic Labs., Inc.
Defiance Engrg. & Microwave Corp.
Fugle-Miller Labs Inc.
Microlab
Saratoga Industries
Spectrum Instruments, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Westinghouse Electric Corp.

Crystal

American Electronic Labs., Inc.
Bliley Electric Co.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Daven Co., The
Diamond Antenna & Microwave Corp.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hycon Eastern Inc.
Lenkurt Electric Co., Inc.
McCoy Electronics Co.
Midland Mfg. Co., Inc.
Ortho Filter Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Electric

Burnell & Co., Inc.
Celco-Constantine Engrg. Laboratories Co.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Fugle-Miller Labs Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Lear, Inc.
Lumen, Inc.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.

Electric Wave Section

Burnell & Co., Inc.
Celco-Constantine Engrg. Laboratories Co.
D & R, Ltd.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Fugle-Miller Labs Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
NYT Electronics, Inc.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
United Transformer Corp.

High Pass

Adler Electronics, Inc.
American Electronics Labs., Inc.
American Research & Mfg. Corp.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Chicago Electronic Engrg. Co., Inc.
Cornell-Dubilier Electric Corp.
D & R, Ltd.
***DATA-CONTROL SYSTEMS INC.**
Daven Co., The
Defiance Engrg. & Microwave Corp.

ESC Corp.
Electronic Transformer Co., Inc.
Entron, Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
Johnson Electronics Inc.
Lenkurt Electric Co., Inc.
Microlab
J. W. Miller Co.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Potter Co., The
Ram Electronics Inc.
Sage Laboratories, Inc.
Saratoga Industries
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Superex Electronics Corp.
Telectro Industries Corp.
Televiso Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.
Western Electro-Acoustic Lab.

I-F

Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Canoga Corp. of California
Carad Corp.
Cornell-Dubilier Electric Corp.
Daven Co., The
Dwyer Engrg. Co., Inc.
Fugle-Miller Labs Inc.
Gudeman Co., The
Hycon Eastern Inc.
Johnson Electronics Inc.
J. W. Miller Co.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Potter Co., The
Superex Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Vanguard Electronics Inc.
Varo Mfg. Co.
Western Coil Products Co.

Interference

Airborne Accessories Corp.
American Electronic Labs., Inc.
Axel Electronics
***BAUSCH & LOMB OPTICAL CO.**
Bulova Watch Co., Electronics Div.
Canoga Corp. of California
Celco-Constantine Engrg. Laboratories Co.
Cornell-Dubilier Electric Corp.
Defiance Engrg. & Microwave Corp.
Eastman Kodak Co.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Hallett Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Interference Measurement Laboratory, Inc.
Johnson Electronics Inc.
Metavac, Inc.
Microlab
J. W. Miller Co.
Polarad Electronics Corp.
Potter Co., The
Saratoga Industries
Southwestern Industrial Electronics Co.
Superex Electronics Corp.
Telectro Industries Corp.
Televiso Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.

Low Pass

Adler Electronics, Inc.
American Electronic Labs., Inc.
American Research & Mfg. Corp.
Axel Electronics
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Canoga Corp. of California
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Chicago Electronic Engrg. Co., Inc.
Cornell-Dubilier Electric Corp.
D & R, Ltd.
Daven Co., The
Defiance Engrg. & Microwave Corp.
Douglas Microwave Co., Inc.
ECS Corp.
Electronic Transformer Co., Inc.
Epsco Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Gulton Industries, Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Highland Engrg. Co.
E. F. Johnson Co.
Johnson Electronics Inc.
Lenkurt Electric Co., Inc.
Microlab
J. W. Miller Co.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
Narda Microwave Corp., The
National Coil Co.
North Hills Electric Co., Inc.
Orbitran Co., Inc.
Ortho Filter Corp.
Polarad Electronics Corp.
Potter Co., The
Sage Laboratories, Inc.
Saratoga Industries
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Superex Electronics Corp.
Telectro Industries Corp.
Televiso Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
Tucson Instrument Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.
Western Electro-Acoustic Lab.

Microwave

Aircom Inc.
Airtron, Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Electronic Labs., Inc.
Applied Research Inc.
Bogart Mfg. Corp.
Bomac Laboratories, Inc.
Canoga Corp. of California
Carad Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Dwyer Engrg. Co., Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
J-V-M Microwave Co.
Johnson Electronics Inc.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
NYT Electronics, Inc.
Narda Microwave Corp., The
Polarad Electronics Corp.
Prodelin Inc.
Radar Design Corp.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Sanders Associates, Inc.
Saratoga Industries
Technical Appliance Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
Uniwave, Inc.
Varo Mfg. Co.
Waveline, Inc.
Waveguide, Inc.

Needle Scratch

Gudeman Co., The
Johnson Electronics Inc.
J. W. Miller Co.
Ortho Filter Corp.
Telectro Industries Corp.
Terminal Radio Corp.
United Transformer Corp.

Noise Suppressing

Airborne Accessories Corp.
Allied Witan Co. Inc.
Axel Electronics
Bulova Watch Co., Electronics Div.
Cornell-Dubilier Electric Corp.
Filtron Co., Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Interference Measurement Laboratory, Inc.
Microlab
Potter Co., The
Telectro Industries Corp.
Televiso Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United Transformer Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Optical

American Optical Co., Instrument Div.
Axler Associates Inc.
Baird-Atomic, Inc.
***BAUSCH & LOMB OPTICAL CO.**
Buhl Optical Co.
Davidson Mfg. Co.
Eastman Kodak Co.
O & S Research, Inc.
Optomechanisms Inc.
Pacific Universal Products Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Wollensak Optical Co.

Polarizing

American Optical Co., Instrument Div.
***BAUSCH & LOMB OPTICAL CO.**
Cornell-Dubilier Electric Corp.
Dwyer Engrg. Co., Inc.
Electronic Transformer Co., Inc.
North Hills Electric Co., Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Transonic, Inc.
Varo Mfg. Co.

Radio

Bulova Watch Co., Electronics Div.
Daven Co., The
Electronic Transformer Co., Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gudeman Co., The
Johnson Electric Inc.
J. W. Miller Co.
Munston Mfg. & Service, Inc.
National Coil Co.
Potter Co., The
Saratoga Industries
Telectro Industries Corp.
Televiso Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.

Radio Noise

Airborne Accessories Corp.
Axel Electronics
Bulova Watch Co., Electronics Div.
Cornell-Dubilier Electric Corp.
Filtron Co., Inc.
Fugle-Miller Labs. Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Gudeman Co., The
Hallett Mfg. Co.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Interference Measurement Laboratroy, Inc.
Johnson Electronics Inc.
P. R. Mallory & Co. Inc.
J. W. Miller Co.
Potter Co., The
Saratoga Industries
Telectro Industries Corp.
Televiso Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Videon Electronic Corp.
United Transformer Corp.
Varo Mfg. Co.

R-F

Airborne Accessories Corp.
Aircom Inc.
Air-Maze Corp.
Airtron, Inc.
Applied Research Inc.
Cornell-Dubilier Electric Corp.
Daven Co. The
Defiance Engrg. & Microwave Corp.
Dwyer Engrg. Co., Inc.
Entron, Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Hycon Eastern Inc.
Johnson Electronics Inc.
Microlab
J. W. Miller Co.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
Ortho Filter Corp.

. . . tracking & telemetering

Potter Co., The
Sage Laboratories, Inc.
Superex Electronics Corp.
Telectro Industries Corp.
Televiso Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Tobe Deutschmann Corp.
United Transformer Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Western Coil Products Co.

Telemetering

American Electronic Labs., Inc.
Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
Carad Corp.
Cornell-Dubilier Electric Corp.
D & R, Ltd.
*DATA-CONTROL SYSTEMS INC.
Daven Co., The
Diamond Antenna & Microwave Corp.
Electronic Transformer Co., Inc.
Epsco Inc.
Fugle-Miller Labs. Inc.
Hermetic Seal Transformer Co., Div.-Southwestern Industrial Electronics
Johnson Electronics Inc.
Lenkurt Electric Co., Inc.
Microlab
Moran Instrument Corp.
NYT Electronics, Inc.
North Hills Electric Co., Inc.
Ortho Filter Corp.
Pacific Div.-Bendix Aviation Corp.
Saratoga Industries
Spectrum Instruments, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELE-DYNAMICS INC.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Topper Mfg. Co., Inc.
Transonic, Inc.
United Electrodynamics, Div.-United Geophysical Corp.
United Transformer Corp.
Varo Mfg. Co.

uhf & vhf

Applied Research Inc.
Daven Co., The
ECS Corp.
Entron, Inc.
Filtron Co., Inc.
Fugle-Miller Labs. Inc.
Hycon Eastern Inc.
Johnson Electronics Inc.
Microlab
Narda Microwave Corp., The
Ortho Filter Corp.
Polarad Electronics Corp.
Prodelin Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Varo Mfg. Co.

Vacuum System

Allied Witan Co. Inc.
Central Electronic Mfgrs., Inc.
Green Rectifier Co.
Nuclear Corp. of America, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Variable Electronic

M F Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Transonic, Inc.
Varo Mfg. Co.

Vestigial Sideband

Bulova Watch Co., Electronics Div.
Burnell & Co., Inc.
D & R, Ltd.
Daven Co., The
Johnson Electronics Inc.
Ortho Filter Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transonic, Inc.
United Transformer Corp.

Wave Trap

Cornell-Dubilier Electric Corp.
Fugle-Miller Labs Inc.
Johnson Electronics Inc.
J. W. Miller Co.
National Coil Co.
North Hills Electric Co., Inc.
Ortho Filter Corp.

Ram Electronics Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Tobe Deutschmann Corp.
Transonic, Inc.
United Transformer Corp.
Vanguard Electronics Co.
Western Coil Products Co.

FLANGES, MICROWAVE

Ainslie Corp.
Aircom Inc.
Airtron, Inc.
Canoga Corp. of California
Coaxial Connector Co. Inc.
Connector Corp. of America
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Co-Operative Industries, Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
J-V-M Microwave Co.
Prodelin Inc.
Radar Design Corp.
Ryan Aeronautical Co.
Technical Appliance Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.
Westbury Electronics Inc.

FORMS, ANTENNA

Ainslie Corp.
Gabriel Co., The Gabriel Electronics Div.
Ryan Aeronautical Co.
Technical Appliance Corp.
Terminal Radio Corp.

FREQUENCY METERS

Acromag Inc.
Aircom Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Boonton Radio Corp.
Computer-Measurements Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Dynac, Inc.
Electro Impulse Lab., Inc.
Erie Resistor Corp.
General Electric Co., Apparatus Sales Div.
Gertsch Products Inc.
Helipot Corp.
Hickok Electrical Instrument Co., The
Hupp Instrumation, Div.—Erie-Pacific
Microwave Electronics Div., Sperry Gyroscope Co.
Potter Aeronautical Corp.
Radar Design Corp.
Saratoga Industries
*TELERAD MFG. CORP.
Terminal Radio Corp.
Varo Mfg. Co.
Wacline, Inc.
Waveline, Inc.

GERMANIUM

Accurate Specialties Co. Inc.
Anchor Metal Co. Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Eagle-Picher Co., The
Harmon, Lichtenstein & Co.

GOLD

Accurate Specialties Co. Inc.
Anchor Metal Co. Inc.
Attleboro Refining Co. Inc.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Wilbur B. Driver Co.
Engelhard Industries Inc., D. E. Makepeace Div.
General Findings & Supply Co., Industrial Div.
Goldsmith Brothers Smelting & Refining Co.
Hamilton Watch Co., Military Products Div.
Handy & Harman
Harper-Leader, Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
J. M. Ney Co., The
Tricon Mfg. Co.

GRID FRAMES

G. M. Dykes Iron Works, Inc.
Gasket, Packing & Specialty Co. Inc.
Star Engraving Co., Ltd.

GRIDS

G. M. Dykes Iron Works, Inc.
Gasket, Packing & Specialty Co. Inc.
Star Engraving Co., Ltd.
Techniques, Inc.

GRILLS, SPEAKER

Flock Process Co. Inc.

HARDWARE

Accurate Electronics Corp., Dept D
Amatom Electronic Hardware Co. Inc.
Automatic & Precision Mfg. Co.
Beaton & Corbin Mfg. Co., The
H. Braun Tool & Instrument Co., Inc.
Capewell Mfg. Co.
Century Fasteners Corp.
*DIVERSEY ENGRG. CO.
Dumont Aviation Associates
General Components Inc.
Goe Engrg. Co.
Hobson Brothers, Inc.
Mercury Air Parts Co., Inc.
Richards Electrocraft, Inc.
Techniques, Inc.
Waldom Electronics Inc.
Wenco Mfg. Co.

HEADPHONES & HEADSETS

International Electric Industries, Inc.
Melody Master Mfg. Co.
Roanwell Corp.
Roflan Co., The
Superex Electronics Corp.
Terminal Radio Corp.

INDICATORS

*R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.
Barnes Development Co.
Consolidated Avionics Corp.
Exact Engrg. & Mfg. Inc.
Farnsworth Electronics Co., Div. Int'l Telephone & Telegraph Corp.
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Greenleaf Mfg. Co., The, Div-Mandrel Industries Inc.
Lear, Inc.
Leeds & Northrup Co.
*WALLACE O. LEONARD, INC.
Motorola Inc., Military Marketing Div.
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missiles Div.
Servomechanisms, Inc.
Task Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.
Wacline, Inc.
Winder Aircraft Corp. of Fla.

Air Position

Consolidated Avionics Corp.
Electric Auto-Lite Co., The
Exact Engrg. & Mfg. Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Hickok Electrical Instrument Co., The
Laboratory for Electronics, Inc.
Task Corp.

Airspeed

Electric Auto-Lite Co., The
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Hickok Electrical Instrument Co., The
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
*WALLACE O. LEONARD, INC.
Pioneer-Central Div., Bendix Aviation Corp.
Task Corp.
U. S. Gauge Div.-American Machine & Metals, Inc.

Angle-of-Yaw

Analogue Controls, Inc.
Computer Instruments Corp.
Crescent Engrg. & Research Co.
Edcliff Instruments
*GARRETT CORP., THE, AIRESEARCH MFG. DIVS.
Hickok Electrical Instrument Co., The
Humphrey, Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
Laboratory for Electronics, Inc.
*WALLACE O. LEONARD, INC.
Reeves Instrument Corp.
Specialties, Inc.
Task Corp.
United Control Corp.

Antenna Position

Airborne Instruments Lab., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Antlab Inc.
Electric Auto-Lite Co., The
Exact Engrg. & Mfg. Inc.
Gabriel Co., The Gabriel Electronics Div.
Humphrey, Inc.
Reeves Instrument Corp.

Bank & Turn

*R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.
Hickok Electrical Instrument Co., The
Humphrey, Inc.

Lear, Inc.
***WALLACE O. LEONARD, INC.**
Pioneer-Central Div., Bendix Aviation Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Drift

General Precision Lab. Inc.
Hickok Electrical Instrument Co., The

Ground Position

General Precision Lab. Inc.
Laboratory for Electronics, Inc.
Reeves Instrument Corp.
Ryan Aeronautical Co.

Gyro

***R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.**
Eclipse-Pioneer Div., Bendix Aviation Corp.
Exact Engrg. & Mfg. Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Humphrey, Inc.
Lear, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Pioneer-Central Div., Bendix Aviation Corp.
Reeves Instrument Corp.
Whittaker Gyro, Div.-Telecomputing Corp.

Instrument Landing System

Eclipse-Pioneer Div., Bendix Aviation Corp.
Laboratory for Electronics, Inc.
Lear, Inc.
Marion Electrical Instrument Co.
Master Specialties Co.
Motorola Inc., Military Marketing Div.
Reeves Instrument Corp.
Ryan Aeronautical Co.

Modulation

Empire Products Sales Corp.
Southwestern Industrial Electronics Co.
Varo Mfg. Co.

Moving Target

Exact Engrg. & Mfg. Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Hazeltine Electronics Div.-Hazeltine Corp.
Laboratory for Electronics, Inc.
Motorola, Inc., Military Marketing Div.
Optomechanisms, Inc.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.

Null

Barnes Delevopment Co.
Boonton Electronics Corp.
Computer Instruments Corp.
Curtiss-Wright Corp., Electronics Div.
Gertsch Products, Inc.
North Atlantic Industries, Inc.
Leeds & Northrup Co.
Lumen, Inc.
Marion Electrical Instrument Co.
Minneapolis-Honeywell Regulator Co., Boston Div.
Owen Labs., Inc.
Herman Hosmer Scott, Inc.
Ultradyne, Inc.
Wacline, Inc.
Westronics, Inc.

Null-Balance

Avien, Inc.
Barnes Development Co.
Boonton Electronics Corp.
North Atlantic Industries, Inc.
Leeds & Northrup Co.
Lumen, Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Moran Instrument Corp.
F. L. Moseley Co.
Herman Hosmer Scott, Inc.
Simmonds Aerocessories, Inc.
M. Ten Bosch, Inc.
Thompson Products, Inc.
Westronics, Inc.

Plan Position

Electric Auto-Lite Co., The
Hazeltine Electronics Div.-Hazeltine Corp.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Winder Aircraft Corp. of Fla.

Speed

General Precision Lab. Inc.
Laboratory for Electronics, Inc.
Pioneer-Central Div., Bendix Aviation Corp.
U. S. Gauge Div.—American Machine & Metals, Inc.
Wacline, Inc.
Waugh Engrg. Co.
Winder Aircraft Corp. of Fla.

Telemetering

American Electronics, Inc.
Burroughs Corp.
Consolidated Avionics Corp.
***COOPER DEVELOPMENT CORP.**
Eagle Signal Corp.
Electric Auto-Lite Co., The
General Electric Co., Apparatus Sales Div.
***WALLACE O. LEONARD, INC.**
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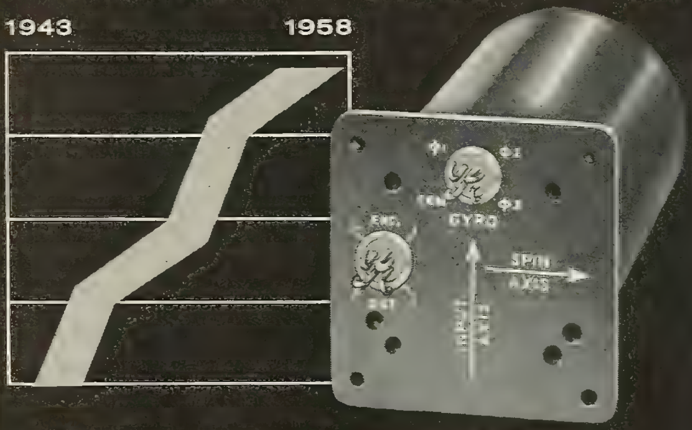
Motorola Inc., Military Marketing Div.
Pacific Div.-Bendix Aviation Corp.
Panoramic Radio Products, Inc.
Ralph M. Parsons Co., The, Electronics Div.
***RADIATION, INC.**
Skiatron Electronics & Television Corp.
***TELE-DYNAMICS INC.**
Ultradyne, Inc.
Varo Mfg. Co.
Whittaker Gyro, Div.-Telecomputing Corp.
Winder Aircraft Corp. of Fla.

True Air Speed

Eclipse-Pioneer Div., Bendix Aviation Corp.
Electric Auto-Lite Co., The
Fairchild Controls Corp., Components Div.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
Greenleaf Mfg. Co., The, Div.-Mandrel Industries, Inc.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co., Inc.
Laboratory for Electronics, Inc.
***WALLACE O. LEONARD, INC.**
Moran Instrument Corp.
M. Ten Bosch, Inc.

Variable

Burnell & Co., Inc.
Celco-Constantine Engrg. Laboratories Co.
Magnetico, Inc.
Telectro Industries Corp.



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. . . tracking & telemetering

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Celco-Constantine Engrg. Laboratories Co.
General Railway Signal Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Highland Engrg. Co.
E. F. Johnson Co.
Lenkurt Electric Co., Inc.
Magnetico, Inc.
Sterling Transformer Corp.
Telectro Industries Corp.
Transformers, Inc.
Tri-Dex Co.
Vari-L Co., Inc.

INFRARED

American Optical Co., Instrument Div.
Avion Div., ACF Industries, Inc.
Barnes Engineering Co.
Electronic Communications, Inc.
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Guided Missile Div.- De Havilland Aircraft of Canada, Ltd.
Librascope Inc.
Mechanical Div.-General Mills, Inc.
Motorola Inc., Military Marketing Div.
Optomechanisms Inc.
Perkin-Elmer Corp.
Philco Corp., Government & Industrial Divs.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Servo Corp. of America
Servomechanisms Inc.
Stewart-Warner Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Detection Systems

American Optical Co., Instrument Div.
Avion Div., ACF Industries, Inc.
Baird-Atomic, Inc.
Barnes Engineering Co.
***BAUSCH & LOMB OPTICAL CO.**
Curtiss-Wright Corp., Industrial & Scientific Products Div.
Eastman Kodak Co.
Electronics Corp. of America
Electronics Dept., Hamilton Standard Div., United Aircraft Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Librascope Inc.
Motorola Inc., Military Marketing Div.
Optomechanisms Inc.
Perkin-Elmer Corp.
Philco Corp., Government & Industrial Divs.
Q. O. S. Corp.
Republic Aviation Corp., Guided Missiles Div.
Servo Corp. of America
Stewart-Warner Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Wollensak Optical Co.

Image Converters

Avion Div., ACF Industries, Inc.
Baird-Atomic, Inc.
Electronics Corp. of America
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Librascope Inc.
Motorola Inc., Military Marketing Div.
Optomechanisms Inc.
Q. O. S. Corp.
Servo Corp. of America
Skiatron Elecronics & Television Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

Systems

Avion Div., ACF Industries, Inc.
Baird-Atomic, Inc.
Barnes Engineering Co.
***BAUSCH & LOMB OPTICAL CO.**
California Technical Industries, Div.-Textron Inc.
Eastman Kodak Co.
Electronic Communications, Inc.
Electronics Corp. of America
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
General Precision Lab. Inc.
Fansworth Eelectronics Co., Div.-Int'l Telephone & Telegraph Corp.
Librascope Inc.
J. A. Maurer, Inc.
Mechanical Div.-General Mills, Inc.
Motorola Inc., Military Marketing Div.
Optomechanisms Inc.
Perkin-Elmer Corp.
Philco Corp., Government & Industrial Divs.
Q. O. S. Corp.
Republic Aviation Corp., Guided Missiles Div.
Ryan Aeronautical Co.
Servo Corp. of America
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**
Wollensak Optical Co.

INSTRUMENTS, ELECTRICAL, MEASURING

Allegany Instrument Co., Inc.
Alto Scientific Co., Inc.
Assembly Products, Inc.
Associated Research, Inc.
Barnes Development Co.
Brush Instruments, Div.-Clevite Corp.
Cambridge Instrument Company, Inc.
Consolidated Electrodynamics Corp.
Cubic Corp.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Dynac, Inc.
Dynamic Instrument Co., Inc.
Electro-Measurements Inc.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
Fenwal Inc.
John Fluke Mfg. Co., Inc.
General Communication Co.
Hagan Chemicals & Controls, Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Instruments Inc.
Instrument Laboratories
***KAHN & CO., INC.**
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
***WALLACE O. LEONARD, INC.**
Marion Electrical Instrument Co.
Meters Inc.
Munston Mfg. & Service, Inc.
Optimized Devices, Inc.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Wacline, Inc.
Winder Aircraft Corp. of Fla.

Ammeters

Alto Scientific Co., Inc.
Assembly Products, Inc.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
Kin Tel Div.-Cohu Electronics, Inc.
General Electric Co., Apparatus Sales Div.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Coil Co.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
Westinghouse Electric Corp.

Audiometers

Barnes Development Co.
Feiler Engrg. & Mfg. Co.
Hammett Electric Co.
Phaostron Instrument & Electronic Co.
Simpson Electric Co.
Terminal Radio Corp.
Varo Mfg. Co.
Western Electro-Acoustic Lab.

Bridges

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
Barnes Development Co.
Boonton Electronics Corp.
Briggs Associates, Inc.
Cambridge Instrument Company, Inc.
Electro-Measurements Inc.
Electro-Tech Equipment Co.
Elm Mfg. Co. Inc.
Feiler Engrg. & Mfg. Co.
Gertsch Products Inc.
Gray Instrument Co.
Hammett Electric Co.
***KAHN & CO., INC.**
Leeds & Northrup Co.
Narda Microwave Corp., The
Optimized Devices, Inc.
Servonic Instruments, Inc.
Simmonds Aerocessories, Inc.
Southwestern Industrial Electronics Co.
***TELERAD MFG. CORP.**
Terminal Radio Corp.

Calibrators

Allegany Instrument Co., Inc.
Ballantine Labs., Inc.
Barnes Development Co.
Davenport Mfg. Co.
Dynamic Instrument Co., Inc.
Feiler Engrg. & Mfg. Co.
Ferris Instrument Co.
John Fluke Mfg. Co., Inc.
Gertsch Products Inc.
Hallamore Electronics Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
North Atlantic Industries, Inc.
Gerard G. Leeds Co., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Moran Instrument Corp.
Optimized Devices, Inc.
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.

Comparators

Barnes Development Co.
***BAUSCH & LOMB OPTICAL CO.**
Brush Instruments, Div.-Clevite Corp.
Cleveland Instrument Co.
Consolidated Avionics Corp.
Davenport Mfg. Co.
Dynac, Inc.
Electro Instruments, Inc.
Electro-Measurements Inc.
Feiler Engrg. Mfg. Co.
John Fluke Mfg. Co., Inc.
General Communication Co.
Hallamore Electronics Co.
Hammett Electric Co.
Jones & Lamson Machine Co.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Optimized Devices, Inc.
Herman Hosmer Scott, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Varo Mfg. Co.
Wintronics

Galvanometers

Assembly Products, Inc.
Barnes Development Co.
James G. Biddle Co.
Cambridge Instrument Company, Inc.
Century Electronics & Instruments, Inc.
Consolidated Electrodynamics Corp.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
General Electric Co., Apparatus Sales Dir.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Kin Tel Div.—Cohu Electronic, Inc.
Leeds & Northrup Co.
Massa Labs., Inc.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Boston Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photron Instrument Co.
Q. V. S. Inc.
Sanborn Co.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Wacline, Inc.

Magnetometers

Barnes Development Co.
Feiler Engrg. & Mfg. Co.
Hammett Electric Co.
Terminal Radio Corp.

Megohmmeters

Associated Research, Inc.
Barnes Development Co.
James G. Biddle Co.
Brush Instruments, Div.-Clevite Corp.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
Hammett Electric Co.
Industrial Instruments Inc.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Q. V. S. Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Microammeters

Assembly Products, Inc.
Barnes Development Co.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Coil Co.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.

Microfaradmeters

Ballantine Labs., Inc.
Barnes Development Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
Hammett Electric Co.
Gerard G. Leeds Co., Inc.
Terminal Radio Corp.

Micro-Microammeters

Barnes Development Co.
Curtiss-Wright Corp., Electronics Div.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
Hammett Electric Co.
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Coil Co.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Terminal Radio Corp.
Wacline, Inc.

Milliammeters

Alto Scientific Co., Inc.
Assembly Prdoucts, Inc.
Barnes Development Co.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Control Co.
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
National Coil Co.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Millivoltmeters

Alto Scientific Co., Inc.
Assembly Products, Inc.
Ballantine Labs., Inc.
Boonton Electronics Corp.
Curtiss-Wright Corp., Electronics Div.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Dunlap Electronics, Inc.
Electric Design & Mfg. Co.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
Fisher Research Lab., Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Control Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
North Atlantic Industries, Inc.
*KAHN & CO., INC.
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Marion Electrical Instrument Co.
Meters Inc.
National Coil Co.
Non-Linear Systems Inc.
Owen Labs., Inc.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.
Thermo Electric Co., Inc.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Ohmmeters

Associated Research, Inc.
Bergen Labs.
James G. Biddle Co.
Davenport Mfg. Co.
Electro Instruments, Inc.
Electro-Tech Equipment Co.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Failer Engrg. & Mfg. Co.
Gray Instrument Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Instruments Inc.
Gerard G. Leeds Co., Inc.
Meters Inc.
Non-Linear Systems Inc.
Optimized Devices, Inc.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Ratiometers

Electro Instruments, Inc.
Feiler Engrg. & Mfg. Co.
Gertsch Products Inc.
Hammett Electric Co.
Kin Tel Div.-Cohu Electronics, Inc.
Gerard G. Leeds Co., Inc.
Non-Linear Systems Inc.
Terminal Radio Corp.

Recorders

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
Amelco, Inc.
Antlab Inc.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Consolidated Electrodynamics Corp.
Curtiss-Wright Corp., Electronics Div.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Electro Instruments, Inc.
Electro-Medical Lab., Inc.
Electro-Tech Equipment Co.
Feiler Engrg. & Mfg. Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Heiland Div.—Minneapolis-Honeywell
Hogan Laboratories, Inc.
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Photron Instrument Co.
*POTTER AERONAUTICAL CORP.
Research Appliance Co.
Sanborn Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Westronics Inc.

Tracers, Signal

Feiler Engrg. & Mfg. Co.
Skiatron Electronics & Television Corp.
Tterminal Radio Corp.
Winder Aircraft Corp. of Fla.

Voltmeters

Acton Laboratories Inc.
Alto Scientific Co., Inc.
Assembly Products, Inc.
Ballantine Labs., Inc.
Bergen Labs.
Boonton Electronics Corp.
Consolidated Electrodynamics Corp.
Cubic Corp.
Davenport Mfg. Co.
Dejur-Amsco Corp.
Dunlap Electronics, Inc.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro Instruments, Inc.
Electronic Associates, Inc.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
John Fluke Mfg. Co., Inc.
Hagan Chemicals & Controls, Inc.
Hammett Electric Co.
Helipot Corp.
Hickok Electrical Instrument Co., The
North Atlantic Industries, Inc.
Keithley Instruments, Inc.
Kin Tel Div.-Cohu Electronics, Inc.
Garard G. Leeds Co., Inc.
Meters Inc.
Munston Mfg. & Service, Inc.
National Coil Co.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Systron Corp.
Terminal Radio Corp.
Trio Laboratories, Inc.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

Volt-Ohm-Milliammeters

Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Industrial Television Inc.
Instrument Laboratories
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Meters Inc.
Munston Mfg. & Service, Inc.
National Coil Co.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
Q. V. S. Inc.
Simpson Electric Co.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Wattmeters

Cubic Corp.
Electro Impulse Lab., Inc.
Electro-Tech Equipment Co.
Epic, Inc.
Feiler Engrg. & Mfg. Co.
General Electric Co., Apparatus Sales Div.
John Fluke Mfg. Co., Inc.
Hickok Electrical Instrument Co., The
Instrument Laboratories
Microwave Electronics Div., Sperry Gyroscope Co.
National Coil Co.
Simpson Electric Co.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

INSTRUMENTS, GRAPHIC RECORDING

Air Logistics Corp.
Airborne Instruments Lab., Inc.
Alden Electronic & Impulse Recording Equip. Co.
Allegany Instrument Co., Inc.
Antlab Inc.
Baird-Atomic, Inc.
Barnes Development Co.
Benson-Lehner Corp.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Centronix Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Curtiss-Wright Corp., Electronics Div.
Devco Engrg. Inc.
Edgerton, Germeshausen & Grier, Inc.
Electric Auto-Lite Co., The
Electro-Tech Equipment Co.
Fischer & Porter Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Hagan Chemicals & Controls, Inc.
Heiland Div.—Minneapolis-Honeywell
Kay Electric Co.
Leeds & Northrup Co.
Massa Labs., Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Offner Electronics Inc.
Palmer Thermometers, Inc.
Perkin-Elmer Corp.
Potter Aeronautical Corp.
Sanborn Co.
Scientific Instrument Co.
Southwestern Industrial Electronics Co.
Tally Register Corp.
Virginia Plak Co.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.
Westronics Inc.

INSULATING COMPOUNDS

Biwax Corp.
Borden Chemical Co., The, Div.-The Borden Co., Resin'te Dept.
Electric Auto-Lite Co., The
Hi-Test Chemical Corp.
***IDEAL CHEMICAL PRODUCTS, INC.**
Mycalex Corp. of America
National Tel-Tronics Corp.
Organic Development Corp., Spectra-Strip Div.
Silicones Div.-Union Carbide Corp.
Swedlow Plastics Co.
Zophar Mills Inc.

INSULATION MATERIALS

Accurate Electronics Corp., Dept D
Aero Leather Products Co.
Auburn Mfg. Co., The
Birnbach Radio Co., Inc.
Bonny Mfg. Corp.
Borden Chemical Co., The., Div.-The Borden Co., Resinite Dept.
William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Diamonite Products Mfg. Co.
Duroyd Gasket Mfg. Co.
Electric Auto-Lite Co., The
Emerson Plastics Corp.
Enflo Corp.
Engineered Plastics, Inc.
General Gasket Inc.
Isolantite Mfg. Corp.
Jodee Plastics Co.
Joseph Kaye & Co.
L. O. F. Glass Fibers Co.
Walter Lee Chemical Corp.
Maryland Lava Co.
Mica Fabricating Co.
Midland Paint & Varnish Co., The
Mycalex Corp. of America
National Tel-Tronics Corp.
Raybestos-Manhattan, Inc.
Rogers Corp.
Rubatex Div., Great American Industries Inc.
St. Regis Paper Co.
Sauereisen Cements Co.
Saxonburg Ceramics
Schlegel Mfg. Co.
Silicone Insulation, Inc.
Silicones, Div.-Union Carbide Corp.
Sparta Mfg. Co.
Spaulding Fibre Co., Inc.
Spruce Pine Mica Co.
D. M. Steward Mfg. Co.
Swedlow Plastics Co.
H. I. Thompson Fiber Glass Co.
Union Asbestos & Rubber Co.

INSULATION PARTS, BEAD INSULATION PARTS

American Lava Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Diamonite Products Mfg. Co.
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Emerson Plastics Corp.
Enflo Corp.
General Ceramics Corp.
Isolantite Mfg. Corp.
Jodee Plastics Co.
Walter Lee Chemical Corp.
Maryland Lava Co.
National Tel-Tronics Corp.
Saxonburg Ceramics
Silicone Insulation, Inc.
D. M. Steward Mfg. Co.

INSULATION PARTS, RODS

Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Diamonite Products Mfg. Co.
Electronic Techniques, Inc.
Emerson Plastics Corp.
Enflo Corp.
General Ceramics Corp.
General Gasket, Inc.
Isolantite Mfg. Corp.
Jodee Plastics Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
Maryland Lava Co.
Mycalex Corp. of America
National Tel-Tronics Corp.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Rex Corp., The
Rogers Corp.
St. Regis Paper Co.
Saxonburg Ceramics
Silicone Insulation, Inc.
D. M. Steward Mfg. Co.
Surprenant Mfg. Co.
Swedlow Plastics Co.

INSULATORS

Accurate Electronics Corp., Dept. D
Auburn Mfg. Co., The
Auburn Spark Plug Co., Inc.
Birnbach Radio Co., Inc.
Biwax Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Diamonite Products Mfg. Co.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Ceramics Corp.
Hallett Mfg. Co.
Industrial Mica Corp.
Isolantite Mfg. Corp.
E. F. Johnson Co.
Lapp Insulator Co., Inc., Radio Specialties Div.
Walter Lee Chemical Corp.
Maryland Lava Co.
Mycalex Corp. of America
National Tel-Tronics Corp.
Peerless Products Industries
Penn Fibre & Specialty Co., Inc.
Saxonburg Ceramics
Silicone Insulation, Inc.
D. M. Steward Mfg. Co.
Tri-Dex Co.
***WESTINGHOUSE ELECTRIC CORP.**

INVERTERS

Airborne Accessories Corp.
Alto Scientific Co., Inc.
American Electronics, Inc.
American Research & Mfg. Corp.
American Television & Radio Co.
Avion Div., ACF Industries, Inc.
Ballantine Labs., Inc.
Cornell-Dubilier Electric Corp.
Eicor Div.-F. L. Jacobs Co.
Electronic Techniques, Inc.
Electrosolids Corp.
General Electric Co., Apparatus Sales Div.
Green Rectifier Co.
Hammett Electric Co.
Jordan Electronics, Div.-Victoreen Instrument Co.
Motordyne, Inc.
Opad Electric Co.
Power Sources, Inc.
TKM Electric Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.

ION TRAPS

Terminal Radio Corp.

ISOLATORS, MICROWAVE

Bogart Mfg. Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Joe Davidson & Associates
Microwave Electronics Div., Sperry Gyroscope Co.
Ryan Aeronautical Co.
Sage Laboratories, Inc.
Techniques, Inc.
Terminal Radio Corp.
Uniwave, Inc.
Waveline, Inc.

JACK PANEL ASSEMBLIES

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Amatom Electronic Hardware Co., Inc.
Empire Electronics Co., Inc.
General Railway Signal Co.
Rowe Industries
Schaffer Air Industries, Inc.
Switchcraft, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

JEWELS

Richard H. Bird & Co., Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Swiss Jewel Co.
Wakmann Watch Co., Inc.

JUNCTION BOXES AND PANELS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
American Electronics, Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
General Railway Signal Co.
Grimes Mfg. Co.
Hallett Mfg. Co.
Kellett Aircraft Corp.
Kolton Electric Mfg. Co.
Lane Electronics Mfg. Corp.
Premier Metal Products Co.
Schaffer Air Industries, Inc.
Swedlow Plastics Co.
Telkor, Inc.

KEYERS

Reeves Instrument Corp.

KILOVOLTMETERS

Associated Research, Inc.
Bracke-Seib X-Ray Co., Inc.
Davenport Mfg. Co.
Electro-Tech Equipment Co.
Ferranti Electric, Inc.
General Electric Co., Apparatus Sales Div.
Gertsch Products, Inc.
Hammett Electric Co.
Keithley Instruments, Inc.
Phaostron Intrument & Electronic Co.
Q. V. S., Inc.
Ryan Aeronautical Co.
Wacline, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

LAMINATIONS, TRANSFORMER

American Printed Circuits Co., Inc.
General Railway Signal Co.
Swedlow Plastics Co.
Topper Mfg. Co., Inc.
J. H. Winn, Inc.

LENSES, ZOOM

***BAUSCH & LOMB OPTICAL CO.**
Buhl Optical Co.
***HAYWARD SCIENTIFIC GLASS CORP.**
Perkin-Elmer Corp.
Wollensak Optical Co.

LIGHTS

Alden Products Co.
Automatic Electric Sales Corp.
Circon Component Corp.
Cole-Hersee Co.
Cutler-Hammer, Inc.
Electronics Corp. of America
General Railway Signal Co.
Grimes Mfg. Co.
Star Engraving Co., Ltd.
Terminal Radio Corp.

Dial, Panel & Pilot

Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co., Inc.
Automatic Electric Sales Corp.
Chicago Miniature Lamp Works
Circon Component Corp.
Cole-Hersee Co.
Cutler-Hammer Inc.
Dialight Corp.
Eldema Corp.
General Electric Co., Apparatus Sales Div.
Green Rectifier Co.
Grimes Mfg. Co.
E. F. Johnson Co.
Kulka Electric Corp.
Marco Industries Co.
Master Specialities Co.
O & S Research, Inc.
Star Engraving Co., Ltd.
Terminal Radio Corp.
Ucinite Co., The, Div.-United Carr Fastener Corp.
United-Carr Fastener Corp.

Black

Cole-Hersee .Co.
Day-Ray Products, Inc.
Grimes Mfg. Co.
Shannon Luminous Materials Co.
Star Engraving Co., Ltd.
Terminal Radio Corp.

Jewel Pilot

Aerolite Electronics Corp.
Amatom Electronic Hardware Co. Inc.
Automatic Electric Sales Corp.
Circon Component Corp.
Cole-Hersee Co.
Dialight Corp.
Eldema Corp.
Green Rectifier Co.
Grimes Mfg. Co.
Marco Industries Co.
Terminal Radio Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
United-Carr Fastener Corp.

Miniature

Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
Automatic Electric Sales Corp.
Chicago Miniature Lamp Works
Circon Component Corp.
Cole-Hersee Co.
Dialight Corp.

Eldema Corp.
Grimes Mfg. Co.
Hudson Lamp Co.
Marco Industries Co.
Signalite Inc.
Star Engraving Co., Ltd.
Terminal Radio Corp.
United-Carr Fastener Corp.

Neon Test

Alden Products Co.
Automatic Electric Sales Corp.
Circon Component Corp.
Dialight Corp.
Master Specialities Co.
Terminal Radio Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.

Photoelectric Source

Electronics Corp. of America
Photobell Co., Inc.
Terminal Radio Corp.

Signal

Aerolite Eletronics Corp.
Amglo Corp.
Dialight Corp.
Eldema Corp.
General Railway Signal Co.
Grimes Mfg. Co.
Kemlite Laboratories, Inc.
Kulka Electric Corp.
Terminal Radio Corp.

LINKS, ANTENNA

Canoga Corp. of California
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Defiance Engrg. & Microwave Corp.
Gabriel Co., The Gabriel Electronics Div.
Technical Appliance Corp.
Telectro Industries Corp.
***TELERAD MFG. CORP.**
Terminal Radio Corp.

LUGS

Amp Inc.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Connector Corp.
Goe Engrg. Co.
Keystone Electronics Corp.
Kulka Electric Corp.
Malco Tool & Mfg. Co.
Terminal Radio Corp.
Waldom Electronics Inc.

MACH LIMIT SWITCHES

Eclipse-Pioneer Div., Bendix Aviation Corp.
Greenleaf Mfg. Co., The, Div.-Mandrel Industries Inc.
Kollsman Instrument Corp., Sub-Standard Coil Products Co., Inc.
Pioneer-Central Div., Bendix Aviation Corp.
Specialities, Inc.
Terminal Radio Corp.

MAGNETS

Arnold Engrg. Co., The
Cutler-Hammer Inc.
Hamilton Watch Co., Military Products Div.
Indiana Steel Products Co., Inc.
Metallurgical Products Dept., General Electric Co.
Permag Corp.
Terminal Radio Corp.
Thomas & Skinner, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

MATRIXES COMPUTER

General Cermamics Corp.
Skiatron Electronics & Television Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Wacline, Inc.

MEMORY

Alden Products Co.
BJ Electronics, Borg-Warner Corp.
Bryant Gage & Spindle Div., Bryant Chucking Grinder Co.
Burroughs Corp.
Consolidated Avionics Corp.
Ferranti Electric Inc.
General Ceramics Corp.
General Railway Signal Co.
Librascope Inc.
Skiatron Electronics & Television Corp.

Crystal

Skiatron Electronics & Television Corp.

Drums

American Electronics, Inc., Data-Tronics Div.
BJ Electronics, Borg-Warner Corp.
Bryant Gage & Spindle Div., Bryant Chucking Grinder Co.
Burroughs Corp.
Ferranti Electric Inc.
General Transistor Western Corp.
Laboratory for Electronics, Inc.
Librascope Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Norton Associates, Inc.
Telectro Industries Corp.

Multi-Core Magnetics

Alden Products Co.
Burroughs Corp.
Consolidated Avionics Corp.
Daystrom Instrument Div., Daystrom, Inc.
General Ceramics Corp.
General Railway Signal Co.
Johnson Electronics Inc.
Librascope Inc.
Rese Engrg., Inc.
Seeburg Corp., The
Servomechanisms, Inc.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Thermo Materials, Inc.
Wacline, Inc.

Systems

Briggs Associates, Inc.
Bryant Gage & Spindle Div., Bryant Chucking Grinder Co.
Burroughs Corp.
Consolidated Avionics Corp.
Ferranti Electric Inc.
Librascope Inc.
Rese Engrg., Inc.
Shannon Luminous Materials Co.
Skiatron Electronics & Television Corp.

Tape Loop

American Electronics, Inc., Data-Tronics Div.
Consolidated Avionics Corp.
Electronic Associates, Inc.
General Transistor Western Corp.
Hamilton Watch Co., Military Products Div.
Johnson Electronics Inc.
Librascope Inc.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Skiatron Electronics & Television Corp.
Soroban Engrg. Inc.
Telectro Industries Corp.

Tubes

Librascope, Inc.
Magnetic Shield Div.-Perfection Mica Co.
Skiatron Electronics & Television Corp.

MICA PLATE AND SHEET

William Brand & Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Mica Fabricating Co.
Micracraft Products, Inc.
Spruce Pine Mica Co.

MICROWAVE ABSORBERS

Airtron, Inc.
Demornay-Bonardi
Dwyer Engrg. Co., Inc.
Electro Impulse Lab., Inc.
McMillan Industrial Corp.
Metavac, Inc.
Radar Design Corp.
Topper Mfg. Co., Inc.
Uniwave, Inc.
Wacline, Inc.

MICROWAVE ACCESSORIES

Ainslie Corp.
Airborne Instruments Lab., Inc.
Airtron, Inc.
Bogart Mfg. Corp.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
***DALMO VICTOR CO., DIV.-TEXTRON, INC.**
Joe Davidson & Associates
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Driaire, Inc.
Electro Impulse Lab., Inc.
Engelhard Industries Inc., D. E. Makepeace Div.
General Communication Co.
John Gombos Co., Inc.
Hansen Electronics Co.
J-V-M Microwave Co.
Laboratory for Electronics, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Omega Labs., Inc.
Radar Design Corp.

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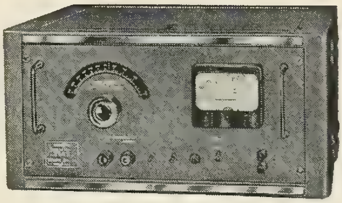

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Ryan Aeronautical Co.
Sage Laboratories, Inc.
Sanders Associates, Inc.
Technical Appliance Corp.
Technical Oil Tool Corp.
***TELERAD MFG. CORP.**
Transco Products, Inc.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.
Waveguide, Inc.

MODULATORS, MAGNETIC

Airtron, Inc.
American Research & Mfg. Corp.

MODULATORS, PHASE

Airtron, Inc.
Bradley Labs.
Servomechanisms, Inc., Mechatrol Div.
Ultradyne, Inc.

MODULATORS, PULSE

Airtron, Inc.
Alto Scientific Co., Inc.
Bradley Labs.
Carad Corp.
Gerard G. Leeds Co., Inc.
Omega Labs., Inc.
Resdel Engrg. Corp.
***WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.**

MONITORING EQUIPMENT, TRANSMISSION

Lampkin Labs., Inc.
***RHEEM MFG. CO., ELECTRONICS DIV.**
Telectro Industries Corp.

MONITORS

Reeves Instrument Corp.
Seeley Electronics
Stromberg-Carlson, Electronics Div.

am-fm Transmitter

Seeley Electronics
Telectro Industries Corp.

Antenna Phase

Reeves Instrument Corp.
Telectro Industries Corp.

Audio

J. A. Maurer, Inc.
Minneapolis-Honeywell Regulator Co.
Setchell-Carlson, Inc.
Telectro Industries Corp.
Varo Mfg. Co.

Frequency

Dunlap Electronics, Inc.
Electro Impulse Lab., Inc.
Lampkin Labs., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Setchell-Carlson, Inc.
Telectro Industries Corp.
Varo Mfg. Co.
Waugh Engrg. Co.

Line & Program

Collins Radio Co.
J. A. Maurer, Inc.
Telectro Industries Corp.

Modulation

Lampkin Labs., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Varo Mfg. Co.

Phase

North Atlantic Industries, Inc.
Telectro Industries Corp.
Theta Instrument Corp.

R-F Power

Collins Radio Co.
Electro Impulse Lab., Inc.
Marconi Instruments
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
Setchell-Carlson Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.

Service

James Cunningham Son & Co., Inc.
Reeves Instrument Corp.
Telectro Industries Corp.

Shift

Phaostron Instrument & Electronic Co.
Telectro Industries Corp.
Waveforms, Inc.

Waveform

Telechrome Mfg. Corp.
Telectro Industries Corp.

MOTORS, TURNTABLE

Advance Industries, Inc.
Ainslie Corp.
Ashland Electric Products, Inc.
Bodine Electric Co.
Bogue Electric Mfg. Co.
Electric Indicator Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Motoresearch Co.
Redmond Co., Inc.
Robot Appliances Inc.
Talley Corp., The
Task Corp.
Telectro Industries Corp.

MOUNTS

Antlab, Inc.
Applied Research Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Federal Machine Co., Inc.
J. W. Fecker Inc., Sub.-American Optical Co.
G. W. Galloway Co.
General Cable Corp.
Hamilton Kent Mfg. Co.
Houston Fearless Corp.
K. W. Johnson & Co., Inc.
Narda Microwave Corp., The
Pic Design Corp., Sub.-Benrus Watch Co., Inc.
Robinson Aviation, Inc.
Roll Formed Products Co.
Rubbercraft Corp. of California
Technical Appliance Corp.
Telectro Industries Corp.
United Mfg. Co., The
Wacline, Inc.
Winder Aircraft Corp. of Fla.

MULTIPLEX SYSTEMS

Applied Research Inc.
***BAUSCH & LOMB OPTICAL CO.**
Browning Laboratories, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS, INC.**
Hoover Electronics Co.
J-V-M Microwave Co.
***TELE-DYNAMICS, INC.**

MULTIPLIERS

American Research & Mfg. Corp.
Daven Co., The
Del Electronics Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Feedback Controls, Inc.
Key Resistor Corp.
Microlab
Phaostron Instrument & Electronic Co.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Transco Products, Inc.

NETWORKS

Advance Industries, Inc.
Alto Scientific Co., Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Filtron Co., Inc.
General Railway Signal Co.
NYT Electronics, Inc.
Southwestern Industrial Electronics Co.
Tobe Deutschmann Corp.

Crossover

Advance Industries, Inc.
Daven Co., The
Johnson Electronics Inc.
La Pointe Industries Inc.
Telectro Industries Corp.
Western Electro-Acoustic Lab.

Directional Antenna Phasing

Daven Co., The
E. F. Johnson Co.
Johnson Electronics Inc.
La Pointe Industries Inc.
Technical Appliance Corp.

Matching

Blonder-Tongue Labs., Inc.
Carad Corp.
Daven Co., The
Johnson Electronics Inc.
La Pointe Industries Inc.
Technical Appliance Corp.
United Transformer Corp.

Potted

Advance Industries, Inc.
Carad Corp.
Dale Products, Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Johnson Electronics Inc.
Key Resistor Corp.
La Pointe Industries Inc.
NYT Electronics, Inc.
Southern Electronics Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tucson Instrument Corp.
Vanguard Electronics Co.
United Transformer Corp.

Pulse Forming

Alto Scientific Co., Inc.
Axel Electronics
Carad Corp.
Corson Electric Mfg. Corp.
Daven Co., The
Filtron Co., Inc.
General Railway Signal Co.
Johnson Electronics Inc.
La Pointe Industries Inc.
NYT Electronics, Inc.
Orbitran Co., Inc.
Plastic Capacitors, Inc.
Saratoga Industries
Telectro Industries Corp.
Tobe Deutschmann Corp.
Tucson Instrument Corp.
Vanguard Electronics Co.
United Transformer Corp.

OPTICAL EQUIPMENT & SPECIALTIES

American Optical Co., Instrument Div.
Applied Research Labs.
Atlantic Research Corp.
Axler Associates Inc.
Baird-Atomic, Inc.
***BAUSCH & LOMB OPTICAL CO.**
Buhl Optical Co.
Coleman Engrg. Co., Inc.
Consolidated Electrodynamics Corp.
Davidson Mfg. Co.
Eastman Kodak Co.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
J. W. Fecker, Inc. Div.-American Optical Co.
General Scientific Equipment Co.
Hamilton Watch Co., Military Products Div.
Hammett Electric Co.
***HAYWARD SCIENTIFIC GLASS CORP.**
Instrument Development Laboratories, Inc.
Jones & Lamson Machine Co.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Mast Development Co., Inc.
J. A. Maurer, Inc.
Merix Chemical Co.
O & S Research, Inc.
Optomechanisms Inc.
***OPTO-METRIC TOOL, INC.**
Pacific Universal Products Corp.
Perkin-Elmer Corp.
Traid Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Task Corp.
Wollensak Optical Co.
Zenith Optical Laboratory

OSCILLATORS

Alpha Instrument Co.
Alto Scientific Co., Inc.
Amerac Inc.
James G. Biddle Co.
Bogart Mfg. Corp.
Boonton Radio Corp.
Borg Equipment Div.-The George W. Borg Corp.
Burnell & Co., Inc.
Canoga Corp. of California
Cardinal Instrumentation Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***COOPER DEVELOPMENT CORP.**
Cubic Corp.
Datran Electronics, Div.—Mid-Continent Mfg., Inc.
Dynac, Inc.
Electronic Communications, Inc.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Haller Raymond & Brown Inc.
***INTERELECTRONICS CORP.**
Lane Electronics Mfg. Corp.

Gerard G. Leeds Co., Inc.
Moran Instrument Corp.
Munston Mfg. & Service, Inc.
Reeves-Hoffman Div.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Ultradyne, Inc.
Varo Mfg. Co.

Audio

Adler Electronics, Inc.
Alto Scientific Co., Inc.
Burnell & Co., Inc.
Canoga Corp. of California
Cardinal Instrumentation Corp.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPMENT CORP.
*DATA-CONTROL SYSTEMS INC.
Dunlap Electronics, Inc.
Dynac, Inc.
Electromation Co.
Elm Mfg. Co. Inc.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
Johnson Electronics Inc.
Kay Electric Co.
Kinevox-Hallen
Lane Electronics Mfg. Corp.
M F Electronics Co.
Munston Mfg. & Service, Inc.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Trans Electronics, Inc.
Varo Mfg. Co.
Waveforms, Inc.

Audio Fork Controlled

Antlab Inc.
Bell & Gossett Co.
Haller Raymond & Brown Inc.
*INTERELECTRONICS CORP.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Walkirt Co.

Audio Frequency

Adler Electronics, Inc.
Amelco, Inc.
James G. Biddle Co.
Cardinal Instrumentation Corp.
*DATA-CONTROL SYSTEMS INC.
Dunlap Electronics, Inc.
Dynac, Inc.
Elm Mfg. Co. Inc.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
Johnson Electronics Inc.
Kay Electric Co.
Lane Electronics Mfg. Corp.
M F Electronics Co.
Munston Mfg. & Service, Inc.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
*TELE-DYNAMICS INC.
Teletronics Laboratory Inc.
Terminal Radio Corp.
Varo Mfg. Co.
Walkirt Co.
Waveforms, Inc.

Cavity

Adler Electronics, Inc.
Amerac Inc.
General Communication Co.
Haller Raymond & Brown Inc.
Moran Instrument Corp.
Resdel Engrg. Corp.
Terminal Radio Corp.

Code

Dunlap Electronics, Inc.
Haller Raymond & Brown Inc.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.
Videon Electronic Corp.

Crystal

Borg Equipment Div.-The George W. Borg Corp.
Cardinal Instrumentation Corp.
*COOPER DEVELOPMENT CORP.
Haller Raymond & Brown Inc.
Hycon Eastern Inc.
Kay Electric Co.
Manson Laboratories, Inc.
Munston Mfg. & Service, Inc.
Reeves-Hoffman Div.
Resdel Engrg. Corp.
Seeburg Corp., The
Telonic Industries, Inc.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Walkirt Co.

Grip Dip-High Frequency & VHF

Alto Scientific Co., Inc.
Boonton Electronics Corp.
Haller Raymond & Brown Inc.
Johnson Electronics Inc.
Terminal Radio Corp.

Microwave

Airborne Instruments Lab., Inc.
Aircom Inc.
Airtron, Inc.
Alfred Electronics
Amerac Inc.
Bogart Mfg. Corp.
CGS Labs., Inc.
California Technical Industries, Div.-Textron Inc.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Dynac, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Geisler Labs.
General Communication Co.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Johnson Electronics Inc.
Kay Electric Co.
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Manson Laboratories, Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Technical Oil Tool Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Waveline, Inc.
Wave Particle Corp.
Weinschel Engrg.

Oven Crystal Control

Bliley Electric Co.
Haller Raymond & Brown Inc.
Manson Laboratories, Inc.
August E. Miller Laboratories
Resdel Engrg. Corp.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.
Textran Corp.
Walkirt Co.
Wilcox Electric Co., Inc.

Pulse

Alto Scientific Co., Inc.
Consolidated Avionics Corp.
Electromation Co.
Erie Resistor Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Johnson Electronics Inc.
Kay Electric Co.
Kinevox-Hallen
Resdel Engrg. Corp.
Rutherford Electronics Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Pushbutton

Consolidated Electrodynamics Corp.
Electronic Measurements Corp.
Haller Raymond & Brown Inc.
Telectro Industries Corp.
Teletronics Laboratory Inc.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.

Radio Frequency

Adler Electronics, Inc.
Airborne Instruments Lab., Inc.
Boonton Electronics Corp.
Boonton Radio Corp.
Cardinal Instrumentation Corp.
Consolidated Electrodynamics Corp.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
*INTERELECTRONICS CORP.
Johnson Electronics Inc.
Kay Electric Co.
Manson Laboratories, Inc.
Munston Mfg. & Service, Inc.
Ralph M. Parsons Co., The, Electronics Div.
Seeburg Corp., The
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Thompson Products, Inc.
Wave Particle Corp.
Weinschel Engrg.

r-f

Adler Electronics, Inc.
Airborne Instruments Lab., Inc.
Alpha Instrument Co.
Boonton Electronics Corp.
Boonton Radio Corp.
Canoga Corp. of California
Cardinal Instrumentation Corp.
Consolidated Electrodynamics Corp.
*COOPER DEVELOPPMENT CORP.
Cubic Corp.
Diamond Antenna & Microwave Corp.
Electronic Communications, Inc.
Geisler Labs.
General Communication Co.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Instrument Motors
*INTERELECTRONICS CORP.
J-V-M Microwave Co.
E. F. Johnson Co.
Johnson Electronics Inc.
Kay Electric Co.
Manson Laboratories, Inc.
Munston Mfg. & Service, Inc.
Ralph M. Parsons Co., The, Electronics Div.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Seeburg Corp., The
Technical Oil Tool Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Terminal Radio Corp.
Wave Particle Corp.

Strain-gage fm, Voltage-Controlled

*DATA-CONTROL SYSTEMS INC.

Sweep

Alfred Electronics
Dynac, Inc.
Geisler Labs.
Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Johnson Electronics Inc.
Kay Electric Co.
Gerard G. Leeds Co., Inc.
Polarad Electronics Corp.
Tel-Instrument Electronics Corp.
Telonic Industries, Inc.
Terminal Radio Corp.

Tuning Fork

Amelco, Inc.
Bell & Gossett Co.
James G. Biddle Co.
Haller Raymond & Brown Inc.
Hamilton Watch Co., Military Products Div.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Varo Mfg. Co.
Walkirt Co.

Ultra-Low Frequency

Haller Raymond & Brown Inc.
Johnson Electronics Inc.
Kay Electric Co.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Terminal Radio Corp.
Vargo Mfg. Co.
Waveforms, Inc.

Ultrasonic

Acoustica Associates, Inc.
Arenberg Ultrasonic Laboratory, Inc.
Dynac, Inc.
Haller Raymond & Brown Inc.
M F Electronics Co.
Southwestern Industrial Electronics Co.
Spectrum Instruments, Inc.
Terminal Radio Corp.
Waveforrm, Inc.

Video Pattern

Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Johnson Electronics Inc.
Kay Electric Co.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.

Video Range

Haller Raymond & Brown Inc.
Hickok Electrical Instrument Co., The
Johnson Electronics Inc.
Kay Electric Co.
Skiatron Electronics & Television Corp.
Technical Engrg. Co.
Terminal Radio Corp.

OSCILLOGRAPHS

Allegany Instrument Co., The
Brush Instruments, Div.-Clevite Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.

. . . tracking & telemetering

Epic, Inc.
Hamilton Watch Co., Military Products Div.
Heiland Div.—Minneapolis-Honeywell
Munston Mfg. & Service, Inc.
Railway Comunications Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Cathode Ray

Allegany Instrument Co., The
Consolidated Electrodynamics Corp.
Dunlap Electronics, Inc.
Edgerton, Germeshausen & Grier, Inc.
General Electric Co., Apparatus Sales Div.
Hickok Electrical Instrument Co., The
Industrial Television Inc.
Munston Mfg. & Service, Inc.
Railway Communications Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Cathode Ray Camera

Allegany Instrument Co., Inc.
Consolidated Electrodynamics Corp.
Edgerton, Germeshausen & Grier, Inc.
Skiatron Electronics & Television Corp.
Telechrome Mfg. Corp.
Terminal Radio Corp.

Cathode Ray Recording, Multichannel

Allegany Instrument Co., Inc.
Consolidated Electrodynamics Corp.
General Electric Co., Apparatus Sales Div.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Direct Writing

Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Electro-Medical Lab., Inc.
Epic, Inc.
Hamilton Watch Co., Military Products Div.
Heiland Div.-Minneapolis-Honeywell
Hogan Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics, Inc.
Photron Instrument Co.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Multi-Channel

Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Centronix, Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Epic, Inc.
Hamilton Watch Co., Military Products Div.
Heiland Div.-Minneapolis-Honeywell
Hogan Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics, Inc.
Photron Instrument Co.
Railway Communications, Inc.
Sanborn Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Multi-Element

Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Hamilton Watch Co., Military Products Div.
Heiland Div.-Minneapolis-Honeywell
Hickok Electrical Instrument Co., The
Hogan Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Photron Instrument Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Portable

Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edin Co., Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Heiland Div.—Minneapolis Honeywell
General Electric Co., Apparatus Sales Div.
Hickok Electrical Instrument Co., The
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics Inc.
Photron Instrument Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Projection

Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Radar

Edgerton, Germeshausen & Grier, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Reeves Instrument Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Recording

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edgerton, Germeshausen & Grier, Inc.
Edin Co., Inc.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Hamilton Watch Co., Military Products Div.
Heiland Div.—Minneapolis-Honeywell
Hogan Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Offner Electronics Inc.
Photron Instrument Co.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.

Transient Study

Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Century Electronics & Instruments, Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Data Instruments, Div.-Telecomputing Corp.
Edgerton, Germeshausen & Grier, Inc.
Edin Co., Inc.
General Electric Co., Apparatus Sales Div.
Heiland Div.—Minneapolis-Honeywell
Minneapolis-Honeywell Regulator Co., Indust. Div.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.

OSCILLOMETERS

Terminal Radio Corp.

OSCILLOSCOPES

Adler Electronics, Inc.
Aeroquip Corp.
Allegany Instrument Co., Inc.
American Electronic Labs., Inc.
***COOPER DEVELOPMENT CORP.**
Dunlap Electronics, Inc.
Edgerton, Germeshausen & Grier, Inc.
Edin Co., Inc.
Electronic Measurements Corp.
Electro-Tech Equipment Co.
Feiler Engrg. & Mfg. Co.
Hickok Electrical Instrument Co., The
Industrial Television Inc.
Laboratory for Electronics, Inc.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Lavoie Labs., Inc.
Gerard G. Leeds Co., Inc.
Munston Mfg. & Service, Inc.
Railway Communications Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Sun Electric Corp.
Telechrome Mfg. Corp.
Terminal Radio Corp.

Cathode Ray

American Electronics Labs., Inc.
***COOPER DEVELOPMENT CORP.**
Edgerton, Germeshausen & Grier, Inc.
Electro-Tech Equipment Co.
Hickok Electrical Instrument Co., The
Industrial Television Inc.
Laboratory for Electronics, Inc.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Gerard G. Leeds Co., Inc.
Railway Communications Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Sun Electric Corp.
Terminal Radio Corp.

Cathode Ray-Multiple Channel

American Electronic Labs., Inc.
Laboratory for Electronics, Inc.
Gerard G. Leeds Co., Inc.
Railway Communictions Inc.
Simpson Electric Co.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

Portable

American Electronic Labs., Inc.
***COOPER DEVELOPMENT CORP.**
Hickok Electrical Instrument Co., The
Laboratory for Electronics, Inc.
Skiatron Electronics & Television Corp.
Southwestern Industrial Electronics Co.
Sun Electric Corp.
Terminal Radio Corp.

Portable Projection

Skiatron Electronics & Television Corp.

OUTLETS, ANTENNA

Continental Diamond Fibre Corp., Sub.—The Budd Co.
Fidelity Chemical Products Corp.
Prodelin Inc.
Technical Appliance Corp.
Telectro Industries Corp.

PAINTS

Amercoat Corp.
Arco Co., The
Dennis Chemical Co.
***IDEAL CHEMICAL PRODUCTS, INC.**
Krylon, Inc.
Midland Paint & Varnish Co., The
Shannon Luminous Materials Co.
L. Sonneborn & Sons, Inc., Building Products Div.
Waldon Electronics Inc.

PANEL BOARDS, ELECTRIC

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Austin Co., The, Special Devices Div.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Cutler-Hammer Inc.
Devco Engrg. Inc.
Franklin Fibre-Lamitex Corp.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Greenbrier Instruments Inc.
Gunnar Laboratories Inc.
A. F. Holden Co., The
Kolton Electric Mfg. Co.
La Pointe Industries Inc.
Lumen, Inc.
Schaffer Air Industries, Inc.
Sohl Co., The
Star Engraving Co., Ltd.
Tucson Instrument Corp.
***WASHINGTON ALUMINUM CO., INC.**
***WESTINGHOUSE ELECTRIC CORP.**

PANELS

Accurate Electronics Corp., Dept. D
Ackerman Engravers, Inc.
Acromark Co., The
Aerolite Electronics Corp.
Allied Engraving & Stamping Co.
Atlantic Engravers, Inc.
Calcor Corp., Aircraft Div.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dale Products, Inc.
Devco Engrg. Inc.
Etched Products Corp.
Franklin Fibre-Lamitex Corp.
General Railway Signal Co.
Greenbrier Instruments Inc.
Gunnar Laboratories
Industrial Engravers Inc.
Keystone Electronics Corp.
Lumen, Inc.
Penn Fibre & Specialty Co., Inc.
Premier Metal Products Co.
Sightmaster Corp.-Mutual Electronic Industries Inc.

Sohl Co., the
Spartan Marking Corp.
Star Engraving Co., Ltd.
Swedlow Plastics Co.
United Mfg. Co., The
United States Radium Corp.
Waldom Electronics Inc.
***WASHINGTON ALUMINUM CO., INC.**
***WESTINGHOUSE ELECTRIC CORP.**

PAPERS, FACSIMILE RECORDING

Alfax Paper & Engrg. Co.
Hogan Laboratories, Inc.
Soroban Engrg., The

PAPER, INSULATION

Auburn Mfg. Co., The
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Duroyd Gasket Mfg. Co.
Penn Fibre & Specialty Co., Inc.
Rogers Corp.
Peter J. Schweitzer, Inc.
Spaulding Fibre Co., Inc.

PAPER, RECORDING

Baird-Atomic, Inc.
Brush Instruments, Div.-Clevite Corp.
Hogan Laboratories, Inc.
Offner Electronics Inc.
Paper Mfgrs. Co.
Sanborn Co.
Peter J. Schweitzer, Inc.
Soroban Engrg., Inc.

PATCH CORDS

AMP Inc.
Aerolite Electronics Corp.
Alden Products Co.
American Super-Temperature Wires, Inc.
Birnbach Radio Co., Inc.
Dunlap Electronics, Inc.
Electronic Techniques, Inc.
International Electric Industries, Inc.
Pomona Electronics Co., Inc.
Telectro Industries Corp.
Vector Electronic Co.
Western International Co.

PATCH PANELS

***AMERICAN MACHINE & FOUNDRY CO.**
AMP Inc.
Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Amelco, Inc.
Electronic Techniques, Inc.
Greenbrier Instruments Inc.
Gunnar Laboratories
Telectro Industries Corp.
Tucson Instrument Corp.
Vector Electronic Co.

PERMEATERS, R-F

Keil Engrg. Products

PHOTO ETCHED COMPONENTS

Bendix Aviation Corp., York Div.
Dale Products, Inc.
Davidson Mfg. Co.
Dunlap Electronics, Inc.
La Pointe Industries Inc.
Pacific Universal Products Corp.
Precision Circuits, Inc.
Sohl Co., The
Zenith Optical Laboratory

PHOTOCELLS & PHOTOTUBES

Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
Electron-Radar Products
Electronics Corp. of America
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Co.
General Electric Co., Apparatus Sales Div.
Infrared Industries Inc.
Instrument Development Laboratories, Inc.
Terminal Radio Corp.

PHOTOELECTRIC CELLS

Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
Electron-Radar Products
Electronics Corp. of America
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Infrared Industries, Inc.
Philco Corp., Government & Industrial Divs.

PHOTOFLASH EQUIPMENT, ELECTRONIC

Amglo Corp.
Davenport Mfg. Co.
Eastman Kodak Co.
Edgerton, Germeshausen & Grier, Inc.
Electronics Corp. of America
Graflex, Inc.
Heiland Div.-Minneapolis-Honeywell
Hershey Mfg. Co.
Kemlite Laboratories, Inc.
Land-Air, Inc., Sub.-California Eastern Aviation, Inc.
Standard Transformer Co.

PHOTOMETERS

Electronics Corp. of America
Optomechanisms, Inc.
Perkin-Elmer Corp.
Terminal Radio Corp.

PICKUP ARMS

Advance Industries, Inc.
Terminal Radio Corp.

PICKUPS

Advance Industries, Inc.
Allegany Instrument Co., Inc.
Atlantic Research Corp.
Chesapeake Instrument Corp.
Cleveland Instrument Co.
Columbia Research Labs.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Dynamic Instrument Co., Inc.
Electro Products Labs., Inc.
MB Mfg. Co.
Sheffield Corp., The, Sub.-Bendix Aviation Corp.
Southwestern Industrial Electronics Co.

PLASTIC, ELECTRICALLY CONDUCTIVE

Aristocrat Plastics, Inc.
Dixon Corp.
Electric Auto-Lite Co., The
Franklin Fibre-Lamitex Corp.
Furane Plastics, Inc.
General Plastics Corp. of New Jersey
Hastings Plastics Inc.
Synthane Corp.
Westlake Plastics, CrystalX Corp.

PLUG-IN-CIRCUIT UNITS

Advance Industries, Inc.
Alden Products Co.
Atlantic Research Corp.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Computer Control Co., Inc.
Consolidated Avionics Corp.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Electronic Engrg. Co. of California
Electronic Processes Corp. of California
Electronic Techniques, Inc.
Electronics Corp. of America
General Railway Signal Co.
La Pointe Industries Inc.
Lytle Engrg. & Mfg. Co.
Methode Mfg. Corp.
Ralph M. Parsons Co., The, Electronics Div.
Precision Circuits, Inc.
Stromberg-Carlson, Electronics Div.
Superex Electronics Corp.
Sylvania Electronic Sysetms, Div.-Sylvania Electric Products Inc.
Vector Electronic Co.
Walkirt Co.

PLUGS

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Alden Products Co.
Auburn Spark Plug Co., Inc.
Automatic & Precision Mfg. Co.
Birnbach Radio Co., Inc.
Electronic Techniques, Inc.
Walter K. Jaros, Aircrafters
E. F. Johnson Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kulka Electric Corp.
Litton Industries, Components Div.
P. R. Mallory & Co. Inc.
Methode Mfg. Corp.
Richards Electrocraft, Inc.
Rubbercraft Corp. of California
Switchcraft, Inc.
Telectro Industries Corp.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
Vector Electronic Co.

POINTERS, DIAL

Canadium Radium & Uranium Corp.
Exact Engrg. & Mfg. Inc.
Jodee Plastics Co.
Litton Industries, Components Div.
Sohl Co., The
Techniques, Inc.
Waldom Electronics Inc.
J. H. Winn Inc.

POSITION INDICATORS

Airborne Instruments Lab., Inc.
Antlab Inc.
Burroughs Corp., Electronic Tube Div.
G. L. Collins Corp.
Consolidated Airborne Systems, Inc.
***COOPER DEVELOPMENT CORP.**
Crescent Engrg. & Research Co.
Cubic Corp.
Electric Auto-Lite Co., The
Electro Products Labs., Inc.
Exact Engrg. & Mfg. Inc.
General Electric Co., Apparatus Sales Div.
Librascope Inc.
Litton Industries, Components Div.
Master Specialties Co.
Master Tape Printers
Milman Engrg. Co.
Reeves Instrument Corp.
Scientific-Atlanta, Inc.
Technical Oil Tool Corp.
United Control Corp.
Varo Mfg. Co.
Wacline, Inc.
Westinghouse Electric Corp.

POSTS, BINDING

Accurate Electronics Corp., Dept. D
Aerolite Electronics Corp.
Affiliated Screw Products Co.
Birnbach Radio Co., Inc.
Coaxial Connector Co. Inc.
Elco Corp.
Electro-Tech Equipment Co.
General Railway Signal Co.
E. F. Johnson Co.
Litton Industries, Components Div.
Malco Tool & Mfg. Co.
Superior Electric Co., The
Waldom Electronics Inc.

POTENTIOMETER TRIMMERS

Ace Electronics Associates, Inc.
Aero Electronics Corp.
Borg Equipment Div.-The George W. Borg Corp.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Joe Davidson & Associates
Dejur-Amsco Corp.
Elektro-Serv Co.
Fairchild Controls Corp., Components Div.
General Controls Co.
Helipot Corp.
Gerard G. Leeds Co., Inc.
Servomechanisms, Inc.
Tucson Instrument Corp.

POTENTIOMETERS

Ace Electronics Associates, Inc.
Allegany Instrument Co., Inc.
American Electronics, Inc.
***ANTON ELECTRONIC LABS., INC.**
Borg Equipment Div.-The George W. Borg Corp.
Brush Instruments Div.-Clevite Corp.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Computer Instruments Corp.
Dale Products, Inc.
Joe Davidson & Associates
Dejur-Amsco Corp.
Dwyer Engrg. Co., Inc.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
Electronics Corp. of America
Elektro-Serv Co.
Fairchild Controls Corp., Components Div.
Gates Electronic Co.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Helipot Corp.
Humphrey, Inc.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
P. R. Mallory & Co., Inc.
Markite Corp.
Multi-Amp Corp.
Narda Microwave Corp., The
Non-Linear Systems Inc.
Osborne Electronic Sales Corp.
Perkin-Elmer Corp.
Servomechanisms, Inc.
Spectrol Electronics Div., Carrier Corp.
Tucson Instrument Corp.

POWER SUPPLIES

Acme Electric Corp.
Airborne Accessories Corp.
Airborne Instruments Lab., Inc.
Airtron, Inc.
American Electronics, Inc.
American Research & Mfg. Corp.
Autonetics, Div.-North American Aviation, Inc.
Avion Div., ACF Industries, Inc.
***BEHLMAN ENGRG. CO.**
Bendix Aviation Corp., Red Bank Div.
Bendix Aviation Corp., York Div.
Bogue Electric Mfg. Co.
Bracke-Seib X-Ray Co., Inc.

Engineered Magnetics, Div. Gulton Industries, Inc.
Computer Engrg. Associates, Inc.
Consolidated Electrodynamics Corp.
Frank R. Cook Co.
Joe Davidson & Associates
Del Electronics Corp.
Eicor Div.-F. L. Jacobs Co.
Electro Products Labs., Inc.
Electronic Assembly Co., Inc.
Electronic Measurements Co., Inc.
Electro-Tech Equipment Co.
Fairfield Engineering Corp.
Fansteel Metallurgical Corp.
Ferranti Electric Inc.
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
General Railway Signal Co.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hammett Electric Co.
Hoover Electronics Co.
*INTERELECTRONICS CORP.
*KAHN & CO., INC.
Kurz & Root Co.
Gerard G. Leeds Co., Inc.
Leeds & Northrup Co.
Master Specialties Co.
J. A. Maurer, Inc.
Mercury Electronic Co.
Minneapolis-Honeywell Regulator Co., Ordnance Div.
Missile Engrg. Products, Inc.
Model Rectifier Corp.
*MOTOR GENERATOR CORP.
Motordyne Inc.
Multi-Amp Corp.
NJE Corp.
NYT Electronics, Inc.
Opad Electric Co.
Optimized Devices, Inc.
Owen Labs., Inc.
Peschel Electronics, Inc.
Plastic Capacitors, Inc.
Power Sources, Inc.
Q. O. S. Corp.
Radiation Counters Labs., Inc.
Resdel Engrg. Corp.
Saratoga Industries
Schauer Mfg. Corp.
Seeburg Corp., The
Stromberg-Carlson, Electronics Div.
Superior Electric Co., The
*TELERAD MFG. CORP.
Telkor, Inc.
Trans Electronics, Inc.
Transistor Devices Inc.
Ultradyne, Inc.
Varo Mfg. Co.
*WESTINGHOUSE ELECTRIC CORP.
Wickes Engrg. & Construction Co. Inc.
Wincharger Corp.
Winder Aircraft Corp. of Fla.

PRE-SELECTORS

Bendix Aviation Corp., York Div.
J-V-M Microwave Co.
Keil Engrg. Products

PRINTED CIRCUITS

Advance Industries, Inc.
Airtron, Inc.
Autonetics, Div.-North American Aviation, Inc.
BJ Electronics, Borg-Warner Corp.
Bendix Aviation Corp., York Div.
Bomyte Co., The
Chart-Pak, Inc.
Circon Component Corp.
Cleveland Metal Specialties Co.
Consolidated Electrodynamics Corp.
Dale Products, Inc.
Diamond Antenna & Microwave Corp.
Dunlap Electronics, Inc.
Dwyer Engrg. Co., Inc.
Eaton Electronics Corp.
Electra-Lab, Inc.
Electronic Techniques, Inc.
Etched Products Corp.
General Components Inc.
Goodyear Aircraft Corp.
Hansen Electronics Co.
Hoover Electronics Co.
La Pointe Industries Inc.
Librascope Inc.
Litton Industries, Comonents Div.
Lytle Engrg. & Mfg. Co.
Methode Mfg. Corp.
Mica Corp.
Milmanco
Motorola Inc., Military Marketing Div.
Mycalex Corp. of America
Narda Microwave Corp., The
Onondaga Pottery Co., Electronics Div.
Precision Circuits, Inc.
Printed Electronics Corp.
Rogers Corp.
Sanders Associates, Inc.
Sohl Co., The
Star Engraving Co., Ltd.
Sylvania Electric Products Inc., Parts Div.
Techniques, Inc.
Technograph Printed Electronics, Inc.
Ucinite Co., The, Div.—United-Carr Fastener Corp.

PROBES

Allegany Instrument Co., Inc.
Diamond Antenna & Microwave Corp.
Sage Laboratories, Inc.
Scala Radio Co.
Wacline, Inc.

Crystal

Baird-Atomic, Inc.
Boonton Electronics Corp.
August E. Miller Laboratories
Sage Laboratories, Inc.
Scala Radio Co.
Uniwave, Inc.

High Frequency

Boonton Electronics Corp.
Electro Impulse Lab., Inc.
Kay Electric Co.
August E Miller Laboratories
Narda Microwave Corp., The
Photobell Co., Inc.
Scala Radio Co.

High Voltage

Scala Radio Co.

Measurement

Allegany Instrument Co., Inc.
Aro Eqipment Corp., The
Boonton Electronics Corp.
Brush Instruments, Div.-Clevite Corp.
Crescent Engrg. & Research Co.
Diamond Antenna & Microwave Corp.
Electro Products Labs., Inc.
Radar Design Corp.
Victory Engineering Corp.

Microwave

Ainslie Corp.
Aircom Inc.
Airtron, Inc.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Electro Impulse Lab., Inc.
Geisler Labs.
J-V-M Microwave Co.
Microlab
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Omega Labs., Inc.
Radar Design oCrp.
Sage Laboratories, Inc.
Technical Appliance Corp.
Telechrome Mfg. Corp.
*TELERAD MFG. CORP.
Uniwave, Inc.
Wacline, Inc.
Waveline, Inc.
Wave Particle Corp.

RADAR BEACONS

Advance Industries, Inc.
Aircraft Armaments, Inc.
Airtron, Inc.
Amelco, Inc.
American Electronic Labs., Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., York Div.
*COOPER DEVELOPMENT CORP.
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Diamond Antenna & Microwave Corp.
Electronic Communications, Inc.
Geisler Labs.
General Communication Co.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
J-V-M Microwave Co.
Lavoie Labs., Inc.
Motorola Inc., Military Marketing Div.
Pacific Div.-Bendix Aviation Corp.
Ralph M. Parsons Co., The, Electronics Div.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
*WASHINGTON ALUMINUM CO., INC.
Wave Particle Corp.

RADIATORS

Acme Electric Heating Co.
Airborne Instruments Lab., Inc.
Haller Raymond & Brown Inc.
Telectro Industries Corp.
Trane Co., The
*UNITED AIRCRAFT PRODUCTS, INC.
Wind Turbine Co.

READOUT DEVICES, COMPUTER

Advance Industries, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Baird-Atomic, Inc.
Bendix Aviation Corp., York Div.
Burroughs Corp., Electronic Tube Div.
Computer-Measurements Corp.
Data Instruments, Div.-Telecomputing Corp.
Dynac, Inc.
Exact Engrg. & Mfg. Inc.
Sherman Fairchild & Assoc. Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Librascope Inc.
Milman Engrg. Co.
Moran Instrument Corp.
Nemeth, Inc.
Non-Linear Systems Inc.
Optomechanisms Inc.
Research Appliance Co.
Sanborn Co.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Telectro Industries Corp.

RECEIVERS

Advance Industries, Inc.
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
*AVCO MFG. CORP., CROSLEY DIV.
Browning Laboratories, Inc.
Cubic Corp.
Dwyer Engrg. Co., Inc.
Electronic Communications, Inc.
General Communication Co.
General Electronic Labs., Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
Land-Air, Inc., Sub.-California Eastern Aviation, Inc.
Lear, Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Republic Aviation Corp., Guided Missiles Div.
Seeley Electronics
Specific Products
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Transvision, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

am, fm Communication

Adler Electronics, Inc.
Aeronautical Electronics, Inc.
Amelco, Inc.
American Electronic Labs., Inc.
*AVCO MFG. CORP., CROSLEY DIV.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
Electronics Corp. of America
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
La Pointe Industries Inc.
Magnavox Co., The
Manson Laboratories, Inc.
Marconi Instruments
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Seeburg Corp., The
Stromberg-Carlson, Electronics Div.
Telechrome Mfg. Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

a-m Fixed Frequency

Adler Electronics, Inc.
Aeronautical Electronics, Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Browning Laboratories, Inc.
Collins Radio Co.
Communications Co.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Magnavox Co., The
Marconi Instruments
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Wunderlich Radio Co.

Automatic Radio Alarm

Haller Raymond & Brown Inc.

Seeley Electronics
Telectro Industries Corp.
Terminal Radio Corp.

Binaural

Browning Laboratories, Inc.
Haller Raymond & Brown Inc.
Herman Hosmer Scott, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Transvision, Inc.

Communication

Aeronautical Electronics, Inc.
Amelco, Inc.
Collins Radio Co.
Communications Co.
Haller Raymond & Brown Inc.
La Pointe Industries Inc.
General Railway Signal Co.
Gray Instrument Co.
Leeds & Northrup Co.
P. R. Mallory & Co. Inc.
Non-Linear Systems Inc.
Ohio Carbon Co., The
Pacific Resistor Co.
Precision, Inc.
Precision Resistor Co. Inc.
Sage Electronics Corp.
Tel-Labs., Inc.
Tepro Electric Co.
Terminal Radio Corp.
Transformers, Inc.
Tucson Instrument Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Direction Finding, Navigation

***AMERICAN MACHINE & FOUNDRY CO.**
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
Cubic Corp.
Electronic Communications, Inc.
Electronics Corp. of America
Haller Raymond & Brown Inc.
Lane Electronics Mfg. Corp.
Magnavox Co., The
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Distance Measuring, Navigation

***AMERICAN MACHINE & FOUNDRY CO.**
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
Cubic Corp.
Electronic Communications, Inc.
Electronics Corp. of America
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Diversity

Communications Co.
Haller Raymond & Brown Inc.
Philco Corp., Government & Industrial Divs.
Telectro Industries Corp.
Terminal Radio Corp.
Wunderlich Radio Co.

Diversity Reception

Haller Raymond & Brown Inc.
Philco Corp., Government & Industrial Divs.
Telectro Industries Corp.
Terminal Radio Corp.
Wunderlich Radio Co.

Facsimile

Alden Electronic & Impulse Recording Equip. Co.
Browning Laboratories, Inc.
Electronic Communications, Inc.
Haller Raymond & Brown Inc.
Hogan Laboratories, Inc.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Stewart-Warner Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Fixed Frequency

Adler Electronics, Inc.
Aeronautical Electronics, Inc.
Airborne Instruments Lab., Inc.
Amelco, Inc.
American Electronics Labs., Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Browning Laboratories, Inc.
Collins Radio Co.
Communications Co.
Frank R. Cook Co.
Electronic Communications, Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Resdel Engrg. Corp.
Seeley Electronics
Telectro Industries Corp.
***TELE-DYNAMICS INC.**
Terminal Radio Corp.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

f-m

Adler Electronics, Inc.
Aeronautical Electronics, Inc.
Amelco, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Blonder-Tongue Labs., Inc.
Browning Laboratories, Inc.
Communications Co.
***DATA-CONTROL SYSTEMS INC.**
Electronic Communications, Inc.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Land-Air, Inc., Sub.—California Eastern Aviation, Inc.
Marconi Instruments
Motorola Inc., Military Marketing Div.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Herman Hosmer Scott, Inc.
Seeburg Corp., The
Seeley Electronics
Stromberg-Carlson, Electronics Div.
Telechrome Mfg. Corp.
Telectro Industries Corp.
***TELE-DYNAMICS INC.**
Terminal Radio Corp.
Transvision, Inc.
Winder Aircraft Corp. of Fla.

f-m Multiplex

Browning Laboratories, Inc.
Collins Radio Co.
Communications Co.
***DATA-CONTROL SYSTEMS, INC.**
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
National Electronics Laboratories, Inc.
Herman Hosmer Scott, Inc.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
***TELE-DYNAMICS INC.**
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Frequency Shift

Amelco, Inc.
Collins Radio Co.
Communications Co.
Electronic Communications, Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Telectro Industries Corp.
Terminal Radio Corp.

Glide Scope, Navigation

Adler Electronics, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Canoga Corp. of California
Collins Radio Co.
Haller Raymond & Brown Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Infra-Red, Navigation

Canoga Corp. of California
Electronic Communications, Inc.
Electronics Corp. of America
Haller Raymond & Brown Inc.
Infrared Industries Inc.
Motorola Inc., Military Marketing Div.
Patterson, Moos Div.-Universal Winding Co., Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Westinghouse Electric Corp.

Loran

Electronic Communications, Inc.
Haller Raymond & Brown Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Telectro Industries Corp.
Terminal Radio Corp.

Microwave

Adler Electronics, Inc.
Aircom Inc.
Airtron, Inc.

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Canoga Corp. of California
Collins Radio Co.
Demornay-Bonardi
Dwyer Engrg. Co., Inc.
Electronic Communications, Inc.
Empire Products Sales Corp.
Geisler Labs.
General Communication Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Lavoie Labs., Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Scientific-Atlanta, Inc.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electronic Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Uniwave, Inc.
Wave Particle Corp.
Wunderlich Radio Co.

Mobile

Aeronautical Electronics, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Communications Co.
*CRAIG SYSTEMS, INC.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Seeley Electronics
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Panoramic

Amelco, Inc.
CGS Labs., Inc.
Haller Raymond & Brown Inc.
Panoramic Radio Products, Inc.
Radio Corporation of America, Defense Electronic Products
Simmonds Aerocessories, Inc.
Sylvania Electronics Systems, Div.-Sylvania Electronic Products Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Portable & Mobile

Aeronautical Electronics, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
*CRAIG SYSTEMS, INC.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Production Research Corp.
Radio Corporation of America, Defense Electronic Products
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
Terminal Aadio Corp.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

Radar

Advance Industries, Inc.
Bendix Aviation Corp., York Div.
Bendix Radio Div.-Bendix Aviation Corp.
Canoga Corp. of California
Electronic Communications, Inc.
Emerson Electric Mfg. Co., The, Electronics & Avionics Div.
General Communication Co.
Goodyear Aircraft Corp.
Haller Raymond & Brown Inc.
J-V-M Microwave Co.
Laboratory for Electronics, Inc.
Lavoie Labs., Inc.
Magnavox Co., The
Motorola Inc., Military Marketing Div.
Pacific Div.-Bendix Aviation Corp.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radio Corporation of America, Defense Electronic Products
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Technical Oil Tool Corp.
Telectro Industries Corp.
*TELERAD MFG. CORP.
Terminal Radio Corp.
Westbury Electronics Inc.
*WESTINGHOUSE ELECTRIC CORP., AIR ARM DIV.

Radiation

Electronics Corp. of America
Haller Raymond & Brown Inc.
Scientific-Atlanta, Inc.
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Radio Communication

Adler Electronics, Inc.
Aeronautical Electronics, Inc.
Amelco, Inc.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Communications Co.
*DATA-CONTROL SYSTEMS, INC.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Lear, Inc.
Magnavox Co., The
Marconi Instruments
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Philco Corp., Government & Industrial Divs.
Production Research Corp.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Telectron Industries Corp.
Terminal Radio Corp.
Telectro Industries Corp.
Varo Mfg. Co.
Wunderlich Radio Co.

Radio, Hand Powered Emergency

Frank R. Cook Co.
Haller Raymond & Brown Inc.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Radio Navigation

Collins Radio Co.
Electronic Communications, Inc.
Haller Raymond & Brown Inc.
Lear, Inc.
Moran Instrument Corp.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Simmonds Aerocessories, Inc.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.
Wunderlich Radio Co.

Remote Pickup, Fixed

Aeronautical Electronics, Inc.
Collins Radio Co.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Simmonds Aerocessories, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Selective Signalling, Navigation

Bell & Gossett Co.
Bendix Radio Div.-Bendix Aviation Corp.
Collins Radio Co.
Haller Raymond & Brown Inc.
Moran Instrument Corp.
Motorola Inc., Military Marketing Div.
Skiatron Electronics & Television Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.

Short Wave, Fixed

Amelco, Inc.
Collins Radio Co.
Communications Co.
Haller Raymond & Brown Inc.
Magnavox Co., The
Motorola Inc., Military Marketing Div.
Resdel Engrg. Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Short Wave, Portable

Amelco, Inc.
Collins Radio Co.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Single Side Band

Adler Electronics, Inc.
Amelco, Inc.
Canoga Corp. of California
Collins Radio Co.
Electronic Communications, Inc.
Haller Raymond & Brown Inc.
Kaiser Aircraft & Electronics Div.-Kaiser Industries Corp.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.
Wunderlich Radio Co.

Transistor Operated

Advance Industries, Inc.
Alto Scientific Co., Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Canoga Corp. of California
Collins Radio Co.
Haller Raymond & Brown Inc.
L E L, Inc.
Motorola Inc., Military Marketing Div.
*RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.
Ryan Aeronautical Co.
Simmonds Aerocessories, Inc.
Stromberg-Carlson, Electronics Div.
Superex Electronics Corp.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Terminal Radio Corp.

uhf

Adler Electronics, Inc.
Aircom Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Applied Research Inc.
Blonder-Tongue Labs., Inc.
Collins Radio Co.
Cubic Corp.
Electronic Communications, Inc.
Empire Products Sales Corp.
General Electronic Labs., Inc.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Lear, Inc.
Magnavox Co., The
Marconi Instruments
Motorola Inc., Miltary Marketing Div.
National Electronics Labortories, Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Resdel Engrg. Corp.
Seeburg Corp., The
Seeley Electronics
Simmonds Aerocessories, Inc.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

vhf

Adler Electronics, Inc.
Aircom Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Applied Research Inc.
Browning Laboratories, Inc.
Collins Radio Co.
Cubic Corp.
Empire Products Sales Corp.
General Electronic Labs., Inc.
Haller Raymond & Brown Inc.
Nems Clarke Co., Div.-Vitro Corp. of America
Lear, Inc.
Marconi Instruments
Motorola Inc., Miltary Marketing Div.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Production Research Corp.
Resdel Engrg. Corp.
Seeburg Corp., The
Simmonds Aerocessories, Inc.
Stavid Engrg., Inc.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Winder Aircraft Corp. of Fla.

WWV

Aircom Inc.
Amelco, Inc.
American Electronic Labs., Inc.
Haller Raymond & Brown Inc.
Lavoie Labs., Inc.
Specific Products
Telechrome Mfg. Corp.
Eelectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

RECEIVING EQUIPMENT, VHF OMNIRANGE

Bendix Radio Div.-Bendix Aviation Corp.
Canoga Corp. of California
Collins Radio Co.
Electronic Instrumentation Co., Div.—Ramo-Wooldridge Corp.
Haller Raymond & Brown Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

RECORDERS

Airborne Instruments Lab., Inc.
Allegany Instrument Co., Inc.
Barnes Development Co.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Cameraflex Corp.
Computer-Measurements Corp.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Fenske Fedrick & Miller Co.
***FLIGHT RESEARCH, INC.**
General Railway Signal Co.
Haller Raymond & Brown Inc.
Heiland Div.—Minneapolis-Honeywell
Leeds & Northrup Co.
Librascope Inc.
J. A. Maurer, Inc.
Perkin-Elmer Corp.
Thompson-Ramo-Wooldridge Products Co., The
Traid Corp.
Reeves Instrument Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Airborne Film

Consolidated Electrodynamics Corp.
Edgerton, Germeshausen & Grier, Inc.
***FLIGHT RESEARCH, INC.**
General Precision Lab. Inc.
Haller Raymond & Brown Inc.
J. A. Maurer, Inc.
Miles Reproducer Co. Inc.
Optomechanisms Inc.
Traid Corp.
Specialties, Inc.
Stancil-Hoffman Corp., The
Telectro Industries Corp.
Vought Co.

Airborne Magnetic

American Electronics, Inc., Data-Tronics Div.
Autonetics, Div.-North American Aviation, Inc.
Centronix Inc.
Consolidated Electrodynamics Corp.
Electromation Co.
Electronic Instrumentation Co., Div.-Ramo-Wooldridge Corp.
General Precision Lab. Inc.
Haller Raymond & Brown Inc.
Kinevox-Hallen
Librascope Inc.
Maico Electronics, Inc.
Miles Reproducer Co. Inc.
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Northam Electronics, Inc.
Peirce Dictation Systems
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Seeburg Corp., The
Stancil-Hoffman Corp., The
Telectro Industries Corp.

Antenna Pattern

Airborne Instruments Lab., Inc.
Antlab Inc.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Haller Raymond & Brown Inc.
Scientific-Atlanta, Inc.
Telectro Industries Corp.

Binaural Tape

American Electronics, Inc., Data-Tronics Div.
Electromation Co.
Graflex, Inc.
International Radio & Electronics Corp.
Kinevox-Hallen
Southwestern Industrial Electronics Co.
Stancil-Hoffman Corp., The
Telectro Industries Corp.
Thompson Products, Inc.

Code

Baird-Atomic, Inc.
Centronix Inc.
J. A. Maurer, Inc.
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Telectro Industries Corp.

Data

Allegany Instrument Co., Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
***AMERICAN MACHINE & FOUNDRY CO.**
Austin Co., The, Special Devices Div.
Baird-Atomic, Inc.
Barnes Development Co.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Data Instruments, Div.-Telecomputing Corp.
Edgerton, Germeshausen & Grier, Inc.
Electromation Co.
Electronic Associates, Inc.
Fenske Fedrick & Miller Co.
Fischer & Porter Co.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hamilton Watch Co., Military Products Div.
Hogan Laboratories, Inc.
Kinevox-Hallen
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Northam Electronics, Inc.
Potter Instrument Co., Inc.
***RADIATION, INC.**
Skiatron Electronics & Television Corp.
Soroban Engrg., Inc.
Southwestern Industrial Electronics Co.
Streeter-Amet Co.
Telectro Industries Corp.
Thompson-Ramo-Wooldridge Products Co., The
Victor Adding Machine Co.
Westinghouse Electric Corp.

Disc

Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Disc Magnetic

Audio-Master Corp.
Autonetics, Div.-North American Aviation, Inc.
Librascope Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

Electronic Rotary Stylus

Skiatron Electronics & Television Corp.

Electronic Self-Balancing Recorders & Indicators

Barnes Development Co.
F. L. Moseley Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
North Atlantic Industries, Inc.
Non-Linear Systems Inc.
Potter Aeronautical Corp.
Reeves Instrument Corp.
Research Appliance Co.
Streeter-Amet Co.
Westronics Inc.

Facsimile

Alden Electronic & Impulse Recording Equip. Co.
Consolidated Avionics Corp.
Haller Raymond & Brown Inc.
Hogan Laboratories, Inc.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Tally Register Corp.

Film

Allegany Instrument Co., Inc.
Cameraflex Corp.
Edgerton, Germeshausen & Grier, Inc.
Electromation Co.
Kinevox-Hallen
Magnasync Mfg. Co., Ltd.
J. A. Maurer, Inc.
Optomechanisms Inc.
Traid Corp.
Vought Co.

Film Stripe, Magnet

Magnasync Mfg. Co., Ltd.
Telectro Industries Corp.

Flight

Cameraflex Corp.
Centronix Inc.
Consolidated Electrodynamics Corp.
Electronic Associates, Inc.
***FLIGHT RESEARCH, INC.**
General Precision Lab. Inc.
Hogan Laboratories, Inc.
Minneapolis-Honeywell Reglator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Traid Corp.
Telectro Industries Corp.

Flight Data

***AMERICAN MACHINE & FOUNDRY CO.**
Arnoux Corp.
Benson-Lehner Corp.
Brush Instruments, Div.-Clevite Corp.
Cameraflex Corp.
Centronix Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
***FLIGHT RESEARCH, INC.**
General Precision Lab. Inc.
Hamilton Watch Co., Military Products Div.
Hogan Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Potter Instrument Co., Inc.
Traid Corp.
***RADIATION, INC.**
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.

Humidity, Electronic

Instruments Corp., The
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.

Millivolt

Allegany Instrument Co., Inc.
Arnoux Corp.
Consolidated Avionics Corp.
Curtiss-Wright Corp., Electronics Div.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Dir.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
F. L. Moseley Co.
Non-Linear Systems Inc.
Offner Electronics Inc.
Research Appliance Co.
Thermo Electric Co., Inc.
Westronics Inc.

Moisture, Electronic

Consolidated Electrodynamics Corp.

Oscillograph

Acton Laboratories Inc.
Allegany Instrument Co., Inc.
Brush Instruments, Div.-Clevite Corp.
Centronix Inc.
Consolidated Avionics Corp.
Consolidated Electrodynamics Corp.
Edgerton, Germeshausen & Grier, Inc.
Edin Co., Inc.
Electro-Medical Lab., Inc.
Epic, Inc.
General Electric Co., Apparatus Sales Div.
Heiland Div.-Minneapolis-Honeywell
Hogan Laboratories, Inc.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Optomechanisms Inc.
Photron Instrument Co.
Southwestern Industrial Electronics Co.

Oxygen

Consolidated Electrodynamics Corp.

Polar

Antlab Inc.
Consolidated Avionics Corp.
Hogan Laboratories, Inc.
Leeds & Northrup Co.
Librascope Inc.

Telemetering

Amelco, Inc.
American Electronics, Inc.
American Electronics, Inc., Data-Tronics Div.
Brush Instruments, Div.-Clevite Corp.
Burroughs Corp.
Centronix Inc.
Consolidated Electrodynamics Corp.
***DATA-CONTROL SYSTEMS INC.**
Electronic Associates, Inc.
Epsco Inc.
Gates Electronic Co.
General Electric Co., Apparatus Sales Div.
Hogan Laboratories, Inc.
Instruments Corp., The
Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Optomechanisms Inc.

Pacific Div.-Bendix Aviation Corp.
***RADIATION, INC.**
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
***TELE-DYNAMICS INC.**
Westinghouse Electric Corp.

RECTIFIERS

Bradley Labs.
Electro-Tech Equipment Co.
Fansteel Metallurgical Corp.
General Electric Co., Apparatus Sales Div.
General Nuclear Corp.
General Railway Signal Co.
Green Rectifier Co.
***INTERELECTRONICS CORP.**
P. R. Mallory & Co., Inc.
Motorola Semiconductor Products Div.
Robins Industries Corp.
Sarkes Tarzian, Inc.
Schauer Mfg. Corp.
Sel-Rex Corp.
Telectro Industries Corp.
***UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.**
United States Dynamics Corp.
Varo Mfg. Co.
Westinghouse Electric Corp.
Winder Aircraft Corp. of Fla.

REFLECTORS, RADAR

Ainslie Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Anderson, Greenwood & Co.
Demornay-Bonardi
Gabriel Co., The Gabriel Electronics Div.
Goodyear Aircraft Corp.
Ryan Aeronautical Co.
Stavid Engrg., Inc.
Technical Appliance Corp.
***WASHINGTON ALUMINUM CO., INC.**
Waveline, Inc.
Winder Aircraft Corp. of Fla.

REGULATORS

American Research & Mfg. Corp.
Baird-Atomic, Inc.
CDC Control Services, Inc.
Curtiss-Wright Corp., Electronics Div.
Cutler-Hammer Inc.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Electric Regulator Corp.
Fenwal Inc.
***GARRETT CORP., THE, AIRESEARCH MFG. DIVS.**
General Electric Co., Apparatus Sales Div.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Nemeth, Inc.
Superior Electric Co., The
Trans Electronics, Inc.
Transistor Devices Inc.
United Control Corp.
Varo Mfg. Co.
Wacline, Inc.

RELAYS

***AMERICAN MACHINE & FOUNDRY CO.**
Aemco Inc.
Advanced Products Co., The
Alto Scientific Co., Inc.
Automatic Electric Sales Corp.
Automatic Switch Co.
Couch Ordnance, Inc.
Cutler-Hammer Inc.
Electric Auto-Lite Co., The
Elgin National Watch Co.
General Railway Signal Co.
***HARTMAN ELECTRICAL MFG. CO., THE**
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Iron Fireman Mfg. Co., Electronics Div.
Magnecraft Electric Co.
Mara Electronics, Inc.
Nemeth, Inc.
Philadelphia Scientific Glass Co.
Simpson Electric Co.
Standard Electromagnetics, Inc.

Capacitance

***AMERICAN MACHINE & FOUNDRY CO.**
Cutler-Hammer Inc.
Leach Corp.
Photobell Co., Inc.

Coaxial

Advance Relays, Electronics Div., Elgin National Watch Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Cutler-Hammer Inc.
Elgin National Watch Co.
General Communication Co.
Magnecraft Electric Co.
Mara Electronics, Inc.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
Joseph Pollak Corp.
Price Electric Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Thompson Products, Inc.
Transco Products, Inc.

Contact

Aemco Inc.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Electro Tec Corp.
Electron-Radar Products
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hi-Spec Electronics Corp.
Leach Corp.
Magnecraft Electric Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Nemeth, Inc.
Price Electric Corp.
Quick Charge Corp.
Relay Sales Inc.
Sealectric Switch & Relay Corp.
Standard Electromagnetics, Inc.

Cross-Bar

***AMERICAN MACHINE & FOUNDRY CO.**
James Cunningham Son & Co., Inc.
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Magnecraft Electric Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Nemeth, Inc.
North Electric Co.
Standard Electromagnetics, Inc.

D Arsonval

***AMERICAN MACHINE & FOUNDRY CO.**
Assembly Products, Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Simpson Electric Co.
Wacline, Inc.
Westinghouse Electric Corp.

Differential

***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Filtors, Inc.
General Electric Co., Apparatus Sales Div.
***HARTMAN ELECTRICAL MFG. CO., THE**
Magnecraft Electric Co.
Mara Electronics, Inc.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
Potter & Brumfield Inc.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Westinghouse Electric Corp.

Electronic, Resistance Activated

Advance Relays, Electronics Div., Elgin National Watch Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Comar Electric Co.
Cutler-Hammer Inc.
Ebert Electronics Corp.
Electron-Radar Products
Elgin National Watch Co.
G-V Controls Inc.
Leach Corp.
Magnecraft Electric Co.
North Electric Co.
Peschel Electronics, Inc.
Sealectric Switch & Relay Corp.
Standard Electromagnetics, Inc.
Victory Engineering Corp.
G. C. Wilson & Co.

Frequency Selective

***AMERICAN MACHINE & FOUNDRY CO.**
James G. Biddle Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
***HARTMAN ELECTRICAL MFG. CO., THE**
Leach Corp.
Nemeth, Inc.
Varo Mfg. Co.
Westinghouse Electric Corp.

High Voltage

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Bendix Aviation Corp., Red Bank Div.
Elgin National Watch Co.
Filtors, Inc.
Guardian Electric Mfg. Co.
Leach Corp.
Mara Electronics, Inc.
Nemeth, Inc.
Peschel Electronics, Inc.
Joseph Pollak Corp.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Westinghouse Electric Corp.

Impulse

***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Comar Electric Co.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Leach Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Tally Register Corp.
***UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.**

Keying & Break-In

Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Elgin National Watch Co.
Guardian Electric Mfg. Co.
E. F. Johnson Co.
Jordan Electronics, Div.-Victoreen Instrument Co.
Leach Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
Nemeth, Inc.
North Electric Co.
Relay Sales Inc.
Standard Electromagnetics, Inc.

Latching

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Allard Instrument Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Automatic Switch Co.
Cutler-Hammer Inc.
Electro-Switch & Controls, Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
Guardian Electric Mfg. Co.
***HARTMAN ELECTRICAL MFG. CO., THE**
Leach Corp.
Magnecraft Electric Co.
***MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.**
North Electric Co.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Sealectric Switch & Relay Corp.
Standard Electromagetics, Inc.
Tally Register Corp.
Transco Products, Inc.
Westinghouse Electric Corp.

Mercury

***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Ebert Electronics Corp.
Electron-Radar Products
Electro-Tech Equipment Co.
Gordos Corp.
Mercury Contacts, Inc.
Philadelphia Scientific Glass Co.
Relay Sales Inc.

Meter

***AMERICAN MACHINE & FOUNDRY CO.**
Electro-Tech Equipment Co.
Simpson Electric Co.
Wacline, Inc.

Microwave

Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Don-Lan Electronics Co.
Geisler Labs.
General Communication Co.
Philco Corp., Government & Industrial Divs.
Thompson Products, Inc.
Uniwave, Inc.

Overfrequency

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., Red Bank Div.
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
*HARTMAN ELECTRICAL MFG. CO., THE
Jordan Electronics, Div.-Victoreen Instrument Co.
Leach Corp.
Varo Mfg. Co.
Westinghouse Electric Corp.

Overload

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer Inc.
Electric Auto-Lite Co., The
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Leach Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
Metals & Controls Corp.
E. V. Naybor Labs., Inc.
North Electric Co.
Price Electric Corp.
Relay Sales Inc.
Tempo Instrument Inc.
Westinghouse Electric Corp.

Overvoltage & Undervoltage

Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer Inc.
Electric Auto-Lite Co., The
Elgin National Watch Co.
Filtors, Inc.
G-V Controls Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Jordan Electronics, Div.-Victoreen Instrument Co.
Leach Corp.
Lumen, Inc.
Magnecraft Electric Co.
North Electric Co.
Joseph Pollak Corp.
Price Electric Corp.
Tempo Instrument Inc.
Waugh Engrg. Co.
Westinghouse Electric Corp.

Photoelectric

*AMERICAN MACHINE & FOUNDRY CO.
Autotron, Inc.
Dunlap Electronics, Inc.
Electron-Radar Products
Electronics Corp. of America
Electro-Tech Equipment Co.
Ess Instrument Co.
Guardian Electric Mfg. Co.
Hi-Spec Electronics Corp.
Joseph Pollak Corp.
Standard Electromagnetics, Inc.
Westinghouse Electric Corp.

Plate Circuit

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Comar Electric Co.
Couch Ordnance, Inc.
Electro-Switch & Controls, Inc.
Elgin National Watch Co.
Filtors, Inc.
Guardian Electric Mfg. Co.
Hi-Spec Electronics Corp.
Iron Fireman Mfg. Co., Electronics Div.
Magnecraft Electric Co.
Mara Electronics, Inc.
E. V. Naybor Labs., Inc.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.

Polarized

*AMERICAN MACHINE & FOUNDRY CO.
Automatic Electric Sales Corp.
Barber-Colman Co.
Bendix Aviation Corp., Red Bank Div.
Thomas A. Edison Ind.; Instrument Div.—McGraw-Edison Co.
Elgin National Watch Co.
Filtors, Inc.
General Railway Signal Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Leach Corp.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Westinghouse Electric Corp.

Power

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
*AMERICAN MACHINE & FOUNDRY CO.
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Cutler-Hammer Inc.
Electro-Switch & Controls, Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
General Electric Co., Apparatus Sales Div.
Guardian Electric Mfg. Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Hi-Spec Electronics Corp.
Leach Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SYITCH & MFG. CO.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Standard Electromagnetics, Inc.
Westinghouse Electric Corp.

Reverse Current

*AMERICAN MACHINE & FOUNDRY CO.
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Thomas A. Edison Ind., Instrument Div—McGraw-Edison Co.
Elgin National Watch Co.
General Electric Co., Sales Apparatus Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Leach Corp.
Mara Electronics, Inc.
Master Specialties Co.

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Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Don-Lan Electronics Co.
General Communication Co.
Leach Corp.
Price Electric Corp.
Relay Sales Inc.
Telectro Industries Corp.
Transco Products, Inc.
Westinghouse Electric Corp.

Rotary

Advance Relays, Electronics Div., Elgin National Watch Co.
Airtron, Inc.
*AMERICAN MACHINE & FOUNDRY CO.
Brubaker Electronics, Inc., Sub.—Telecomputing Corp.
Couch Ordnance, Inc.
Cutler-Hammer Inc.
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Filtors, Inc.
General Communication Co.
Guardian Electric Mfg. Co.
Hi-G, Inc.
G. H. Leland, Inc.
Magnavox Co., The
Magnecraft Electric Co.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Nemeth, Inc.
North Electric Co.
Price Electric Corp.
Relay Sales Inc.
*UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.

Sensitive

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Aerolite Electronics Corp.
*AMERICAN MACHINE & FOUNDRY CO.
Assembly Products, Inc.
Automatic Electric Sales Corp.
Automatic Switch Co.
Comar Electric Co.
Couch Ordnance, Inc.
Cutler-Hammer Inc.
General Electric Co., Apparatus Sales Div.
Thomas A. Edison Ind., Instrument Div.—McGraw-Edison Co.
Electro-Switch & Controls, Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
Filtors, Inc.
General Railway Signal Co.
Guardian Electric Mfg. Co.
*HARTMAN ELECTRICAL MFG. CO., THE
Hi-Spec Electronics Corp.
Iron Fireman Mfg. Co., Electronics Div.
Lumen, Inc.
Magnecraft Electric Co.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
Philadelphia Scientific Glass Co.
Joseph Pollak Corp.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Research Appliance Co.
Simpson Electric Co.
Standard Electromagnetics, Inc.
Tempo Instrument Inc.
Varo Mfg. Co.
Victory Engineering Corp.

Stepping

*AMERICAN MACHINE & FOUNDRY CO.
Cutler-Hammer Inc.
Joe Davidson & Associates
Eagle Signal Corp.
Electro-Tech Equipment Co.
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
*A. W. HAYDON CO., THE
Leach Corp.
G. H. Leland, Inc.
Mara Electronics, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Price Electric Corp.

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Relay Sales Inc.
Sealectric Switch & Relay Corp.
Standard Electromagnetics, Inc.

Subminiature

Aemco Inc.
Advance Relays, Electronics Div., Elgin National Watch Co.
Aero Electronics Corp.
Airtron, Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Electric Sales Corp.
Brubaker Electronics, Inc., Sub.-Telecomputing Corp.
Comar Electric Co.
Couch Ordnance, Inc.
Cutler-Hammer Inc.
Electro-Switch & Controls, Inc.
Elgin National Watch Co.
Engelhard Industries Inc., D. E. Makepeace Div.
Filtors, Inc.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hi-G, Inc.
Iron Fireman Mfg. Co., Electronics Div.
Leach Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
North Electric Co.
Potter & Brumfield Inc.
Price Electric Corp.
Relay Sales Inc.
Simpson Electric Co.
Standard Electromagnetics, Inc.
Telectro Industries Corp.
Tempo Instrument Inc.
***UNION SWITCH & SIGNAL, DIV.-WESTINGHOUSE AIR BRAKE CORP.**
Victory Engineering Corp.

Temperature Compensated

***AMERICAN MACHINE & FOUNDRY CO.**
Assembly Products, Inc.
Cutler-Hammer Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electro-Switch & Controls, Inc.
Elgin National Watch Co.
General Electric Co., Apparatus Sales Div.
G-V Controls Inc.
***HARTMAN ELECTRICAL MFG. CO., THE**
E. Vernon Hill & Co.
Nemeth, Inc.
Joseph Pollak Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Thermal

Advance Relays, Electronics Div., Elgin National Watch Co.
***AMERICAN MACHINE & FOUNDRY CO.**
Cutler-Hammer Inc.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electron-Radar Products
Elgin National Watch Co.
G-V Controls Inc.
General Railway Signal Co.
Relay Sales Inc.
Vap-Air Div., Vapor Heating Corp.
Victory Engineering Corp.

Thermostatic Delay

***AMERICAN MACHINE & FOUNDRY CO.**
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electro-Tech Equipment Co.
G-V Controls Inc.
Iron Fireman Mfg. Co., Electronics Div.
Leach Corp.
Relay Sales Inc.
Vap-Air Div., Vapor Heating Corp.

Time Delay

Abrams Instrument Corp.
Advance Relays, Electronics Div., Elgin National Watch Co.
Advanced Products Co., The
Aero Electronics Corp.
Alto Scientific Co., Inc.
***AMERICAN MACHINE & FOUNDRY CO.**
Amglo Corp.
Automatic Electric Sales Corp.
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Comar Electric Co.
Cutler-Hammer Inc.
Joe Davidson & Asociates
Eagle Signal Corp.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electron-Radar Products
Electronic Techniques, Inc.
Electronics Corp. of America
Electro-Switch & Controls, Inc.
Electro-Tech Equipment Co.
Elgin National Watch Co.
G-V Controls Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hamilton Watch Co., Military Products Div.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Jordan Electronics, Div.-Victoreen Instrument Co.
Leach Corp.
Magnecraft Electric Co.
Mara Electronics, Inc.
Master Specialties Co.
E. V. Naybor Labs., Inc.
Nemeth, Inc.
North Electric Co.
Price Electric Corp.
Quick Charge Corp.
Relay Sales Inc.
Simpson Electric Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
Tempo Instrument Inc.
Vemaline Products Co.
Waugh Engrg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
G. C. Wilson & Co.

Timing

Abrams Instrument Corp.
***AMERICAN MACHINE & FOUNDRY CO.**
Amglo Corp.
Cutler-Hammer Inc.
Eagle Signal Corp.
Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Electronic Techniques, Inc.
Electronics Corp. of America
Electro-Tech Equipment Co.
Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Guardian Electric Mfg. Co.
Hamilton Watch Co., Military Products Div.
***A. W. HAYDON CO., THE**
Haydon Div.-General Time Corp.
Jordan Electronics, Div.-Victoreen Instrument Co.
Nemeth, Inc.
Price Electric Corp.
Simpson Electric Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
Tempo Instrument Inc.
Vemaline Products Co.
***WESTINGHOUSE ELECTRIC CORP.**
G. C. Wilson & Co.

Under Frequency

***AMERICAN MACHINE & FOUNDRY CO.**
Automatic Switch Co.
Bendix Aviation Corp., Red Bank Div.
Elgin National Watch Co.
General Electric Co., Sales Apparatus Div.
G-V Controls Inc.
***HARTMAN ELECTRICAL MFG. CO., THE**
Jordan Electronics, Div.-Victoreen Instrument Co.
Leach Corp.
Lumen, Inc
Research Appliance Co
Telectro Industries Corp.
Varo Mfg. Co.
Waugh Engrg. Co.

Vacuum Contact

***AMERICAN MACHINE & FOUNDRY CO.**
Gordos Corp.
Penta Labs, Inc.
Relay Sales Inc.
Telectro Industries Corp.

Vibrating Reed Type

***AMERICAN MACHINE & FOUNDRY CO.**
American Television & Radio Co.
Amglo Corp.
Automatic Electric Sales Corp.
Bell & Gossett Co.
James G. Biddle Co.
Cutler-Hammer Inc.
Electric Auto-Lite Co., The
Gordos Corp.
North Electric Co.
Telectro Industries Corp.

REMOTE PICK-UP, AUDIO

Magnasync Mfg. Co., Ltd.
Motorola Inc., Military Marketing Div.
Telectro Industries Corp.
Varo Mfg. Co.

REPEATERS, MICROWAVE

Motorola Inc., Military Marketing Div.
Telectro Industries Corp.

REPEATERS, PASSIVE, MICROWAVE

Ainslie Corp.
Demornay-Bonardi
Gabriel Co., The Gabriel Electronics Div.
Motorola Inc., Military Marketing Div.
Reeves Instrument Corp.
Telectro Industries Corp.

RESISTANCE THERMOMETER BULBS

Thomas A. Edison Ind., Instrument Div.-McGraw-Edison Co.
Rosemount Engrg. Co.
Trans-Sonics, Inc.
United Control Corp.

RESISTORS

Analogue Controls, Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Daven Co., The
Dwyer Engrg. Co., Inc.
Electro-Measurements Inc.
General Railway Signal Co.
General Transistor Corp.
Globar Plant, Refractories Div.-The Carborundum Co.
Key Resistor Corp.
Leeds & Northrup Co.
Ohio Carbon Co., The
Pacific Resistor Co.
Precision Resistor Co. Inc.
Terminal Radio Corp.

Boroncarbon

Key Resistor Corp.
Terminal Radio Corp.

Composition, Variable

Ace Electronics Associates, Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Key Resistor Corp.
Terminal Radio Corp.

Carbon Film

Cal-Ohm Labs., Inc.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Erie Resistor Corp.
Key Resistor Corp.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

Decade

Cal-Ohm Labs., Inc.
Daven Co., The
Electro-Measurements Inc.
Gray Instrument Co.
Key Resistor Corp.
Pacific Resistor Co.
Precise Development Corp.
Precision Resistor Co. Inc.
Terminal Radio Corp.

Deposited Carbon

Cal-Ohm Labs., Inc.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Erie Resistor Corp.
Key Resistor Corp.
P. R. Mallory & Co. Inc.
Morganite, Inc.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

Encapsulated

Axel Electronics
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Gordos Corp.
Key Resistor Corp.
Morganite, Inc.
Non-Linear Systems Inc.
Pacific Resistor Co.
Precision Resistor Co. Inc.
Terminal Radio Corp.
Transformers, Inc.

Film

Cal-Ohm Labs., Inc.
Clarostat Mfg. Co., Inc.
Corning Glass Works
Dale Products, Inc.
Daven Co., The
Filmohm Corp.
Key Resistor Corp.
Metavac, Inc.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

Fixed Composition

Clarostat Mfg. Co., Inc.
Dale Products, Inc.

Globar Plant, Refractories Div.-The Carborundum Co.
P. R. Mallory & Co. Inc.
Morganite, Inc.
Ohio Carbon Co., The
Tepro Electric Co.
Terminal Radio Corp.

Fixed Wire-Wound

Axel Electronics
Bradford Components, Inc.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Daven Co., The
Electro-Flex Heat, Inc.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
General Electric Co., Apparatus Sales Div.
Land-Air, Inc., Sub.-California Eastern Aviation, Inc.
La Pointe Industries Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
National Electronics Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Radio Corporation of America, Defense Electronic Products
Seeburg Corp., The
Seeley Electronics
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Terminal Radio Corp.
Winder Aircraft Corp. of Fla.

Fuse

Bradford Components, Inc.
Clarostat Mfg. Co., Inc.
Daven Co., The
P. R. Mallory & Co. Inc.
Ohio Carbon Co., The
Terminal Radio Corp.

Glass

Corning Glass Works
Daven Co., The
Erie Resistor Corp.
Filmohm Corp.
Metavac, Inc.
Morganite, Inc.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

High Frequency

Dale Products, Inc.
Electro Impulse Lab., Inc.
Filmohm Corp.
Globar Plant, Refractories Div.-The Carborundum Co.
Hansen Electronics Co.
Key Resistor Corp.
Ohio Carbon Co., The
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.

High Temperature

Abrams Instrument Corp.
*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Dale Products, Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Filmohm Corp.
Key Resistor Corp.
Pacific Resistor Co.
Pyrofilm Resistor Co., Inc.
Sage Electronics Corp.
Spectrol Electronics Div., Carrier Corp.
Tepro Electric Co.
Terminal Radio Corp.

High Voltage

*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Clarostat Mfg. Co., Inc.
Dale Products, Inc.
Key Resistor Corp.
Morganite, Inc.
Ohio Carbon Co., The
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.
*WESTINGHOUSE ELECTRIC CORP.

Industrial, Fixed

Clarostat Mfg. Co., Inc.
Dale Products, Inc.
General Electric Co., Apparatus Sales Div.
P. R. Mallory & Co. Inc.
Ohio Carbon Co., The
Pacific Resistor Co.
Terminal Radio Corp.

Miniature Variable

Chicago Telephone Supply Corp.
Clark Electronic Laboratories
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Joe Davidson & Associates
General Controls Co.
Humphrey, Inc.
P. R. Mallory & Co. Inc.
Precision Line Inc.
Spectrol Electronics Div., Carrier Corp.
Terminal Radio Corp.
Tucson Instrument Corp.

Negative Temperature Coefficient

*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Clark Electronic Laboratories
Daven Co., The
Key Resistor Corp.
Keystone Carbon Co.
Morganite, Inc.
Pyrofilm Resistor Co., Inc.
Terminal Radio Corp.
Victory Engineering Corp.

Photo Sensitive

Eastman Kodak Co.
Infrared Industries Inc.
Terminal Radio Corp.

Plug-In-Tube

Dale Products, Inc.
Daven Co., The
Terminal Radio Corp.

Precision

Bradford Components, Inc.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Electro-Mec Lab. Inc.
Filmohm Corp.
General Transistor Corp.
Gray Instrument Co.
Humphrey, Inc.
Key Resistor Corp.
Leeds & Northrup Co.
Metavac, Inc.
Non-Linear Systems Inc.
Pacific Resistor Co.
Precision, Inc.
Pyrofilm Resistor Co., Inc.
Sage Electronics Corp.
Spectrol Electronics Div., Carrier Corp.
Tepro Electric Co.
Terminal Radio Corp.
Transformers, Inc.
Tucson Instrument Corp.
*WESTINGHOUSE ELECTRIC CORP.

Printed Circuit

Carbone Corp., The
Chart-Pak, Inc.
Dale Products, Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Filmohm Corp.
General Transistor Corp.
Hansen Electronics Co.
P. R. Mallory & Co. Inc.
Milmanco
Non-Linear Systems Inc.
Onondaga Pottery Co., Electronics Div.
Sohl Co., The
Terminal Radio Corp.

Printed Strip

Dale Products, Inc.
Filmohm Corp.
Hansen Electronics Co.
Naz-Dar Co.
Sohl Co., The
Techniques, Inc.
Terminal Radio Corp.

Rectilinear

Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Daven Co., The
Hansen Electronics Co.
Humphrey, Inc.
Precision Line Inc.
Terminal Radio Corp.

Silicone

Ace Electronics Associates, Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Daven Co., The
Key Resistor Corp.
Morganite, Inc.
Pacific Resistor Co.
Rubbercraft Corp. of California
Sage Electronics Corp.
Tepro Electric Co.
Terminal Radio Corp.

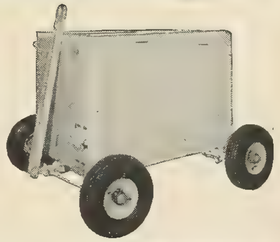
Subminiature

*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Cal-Ohm Labs., Inc.
Dale Products, Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Filmohm Corp.
Hansen Electronics Co.
P. R. Mallory & Co. Inc.
Pacific Resistor Co.
Precision, Inc.
Tepro Electric Co.
Terminal Radio Corp.
Tucson Instrument Corp.

PRESSURIZATION!!!

Now get the facts on Kahn's versatile new Portable Air Stand. This dependable, portable equipment provides HIGH PRESSURE – dry air or nitrogen for pressurizing aircraft or missile systems.

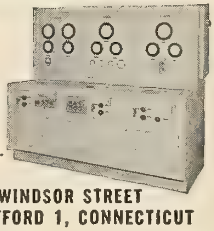
- 4-Stage Compressor delivers 15 SCFM of dry air at pressures to 5000 PSIG.
- Kahn's High Pressure Automatic Dryer provides dryness of minus 65 degrees F. or lower dew point.



KAHN'S HIGH PRESSURE PNEUMATIC ACCESSORIES TEST STAND

Highly versatile 3-Station Component Test Stand delivers 5000 psi. air at minus 65 degrees F. dew point. Tests components such as Pressure Switches, Solenoids, Cylinders etc. KAHN'S INTERLOCK SAFETY feature prevents component tampering under pressure.

Inquiries Invited.



Kahn and Company, Inc.
541 WINDSOR STREET
HARTFORD 1, CONNECTICUT

Tape

Cal-Ohm Labs., Inc.
Daven Co., The
Dwyer Engrg. Co., Inc.
Hansen Electronics Co.
Terminal Radio Corp.

Temperature Sensitive

*AMERICAN STEEL & WIRE DIV.-UNITED STATES STEEL CORP.
Axel Electronics
Cal-Ohm Labs., Inc.
Carbone Corp., The
Daven Co., The
General lectric Co., Apparatus Sales Div.
Gray Instrument Co.
Green Rectifier Co.
Keystone Carbon Co.
Master Tape Printers
Metavac, Inc.
Minco Products, Inc.
Precision, Inc.
Rosemount Engrg. Co.
Terminal Rdaio Corp.
Vap-Air Div., Vapor Heating Corp.
Victory Engineering Corp.

Variable Composition

Ace Electronics Associates, Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
Terminal Radio Corp.

Variable, Miniature

Ace Electronics Associates, Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Joe Davidson & Associates
Edcliff Instruments
General Controls Co.
P. R. Mallory & Co. Inc.
Precision Line Inc.
Spectrol Electronics Div., Carrier Corp.
Terminal Radio Corp.
Tucson Instrument Corp.

Variable Wire Wound

Ace Electronics Associates, Inc.
Analogue Controls, Inc.
Bradford Components, Inc.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Joe Davidson & Associates
Electro-Mec Lab. Inc.
General Controls Co.
General Railway Signal Co.
Leeds & Northrup Co.
P. R. Mallory & Co. Inc.
Pacific Resistor Co.
Precision Line Inc.
Spectrol Electronics Div., Carrier Corp.
Terminal Radio Corp.
Tucson Instrument Corp.

Wire Wound

Ace Electronics Associates, Inc.
American Electronics, Inc.
Axel Electronics
Bradford Components, Inc.
Cal-Ohm Labs., Inc.
Chicago Telephone Supply Corp.
Clarostat Mfg. Co., Inc.
F. W. Corbett Science Labs.
Dale Products, Inc.
Daven Co., The
Electro-Flex Heat, Inc.
Electro-Measurements Inc.
Electro Mec Lab. Inc.
General Electric Co., Apparatus Sales Co.
General Railway Signal Co.
General Transistor Corp.
Industrial Instruments Inc.
Key Resistor Corp.
P. R. Mallory & Co. Inc.
Ohio Carbon Co., The
Pacific Resistor Co.
Precision, Inc.
Precision Line Inc.
Sage Electronics Corp.
Spectrol Electronics Div. Carrier Corp.
Tepro Electric Co.
Terminal Radio Corp.

RESOLVERS

Cedar Engrg. Div.-Control Data Corp.
Diehl Mfg. Co.
Eclipse-Pioneer Div., Bendix Aviation Corp.
Electronics Corp. of America
Farnsworth Electronics Co., Div., Int'l Telephone & Telegraph Corp.
Helipot Corp.
Kearfott Co., Inc.
Reeves Instrument Corp.

RHEOSTATS

Analogue Controls, Inc.
James G. Biddle Co.
Clarostat Mfg. Co., Inc.
Cutler-Hammer Inc.
Dejur-Amsco Corp.
Electro-Measurements Inc.
Electro-Mec Lab. Inc.
Electro-Tech Equipment Co.
General Controls Co.
General Electric Co., Apparatus Sales Div.
Grimes Mfg. Co.
P. R. Mallory & Co. Inc.
Joseph Pollak Corp.
Precision Line Inc.
Superior Electric Co., The
Tucson Instrument Corp.
*WESTINGHOUSE ELECTRIC CORP.

SCANNERS, REFLECTED & TRANSMITTED LIGHT

Austin Co., The, Special Devices Div.
Electronics Corp. of America
Hogan Laboratories Inc.
Instrument Development Laboratories, Inc.
Menlo Research Lab.
Optomechanisms, Inc.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.

SELECTIVE CALLING APPARATUS

Bell & Gossett Co.
Benson-Lehner Corp.
Collins Radio Co.
Motorola Inc., Military Marketing Div.
Photobell Co., Inc.
Reeves Instrument Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Varo Mfg. Co.

SENSING DEVICES

Aeroflex Corp.. The, Aeroflex Labs. Div.
BJ Electronics, Borg-Warner Corp.
Baird-Atomic, Inc.
Benson-Lehner Corp.
CDC Control Services, Inc.
Consolidated Electrodynamics Corp.
Dynametrics Corp.
Eastman Kodak Co.
Electro Products Labs., Inc.
Electronic Processes Corp. of California
Electronics Corp. of America
Friez Instrument Div.-Bendix Aviation Corp.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Instrument Development Laboratories, Inc.
Massa Labs., Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Optomechanisms Inc.
Perkin-Elmer Corp.
Reeves Instrument Corp.
Stanley Aviation Corp.
Varo Mfg. Co.

SEXTANTS, PERISCOPE TYPE

Baird-Atomic, Inc.
Buhl Optical Co.
*HAYWARD SCIENTIFIC GLASS CORP.
Kollsman Instrument Corp., Sub.-Standard Coil Products Co. Inc.
Optomechanisms Inc.

SHEETS, METAL CLAD, PRINTED CIRCUIT

Continental Diamond Fibre Corp., Sub.-The Budd Co.
La Pointe Industries Inc.
Magnetic Shield Div.-Perfection Mica Co.
New England Laminates Co., Inc.
St. Regis Paper Co.
Synthane Corp.
Techniques, Inc.

SHIELDING

H. Braun Tool & Instrument Co., Inc.
Hallett Mfg. Co.
International Electronics Research Corp.
Magnetic Shield Div.-Perfection Mica Co.
Swedlow Plastics Co.

Cathode Ray Tube

Suffolk Products Corp.

Coil

Hallett Mfg. Co.
Magnetic Shield Div.-Perfection Mica Co.
Paul & Beekman, Inc.

Electrostatic

American Brass Co., The
Auburn Mfg. Co., The
Belden Mfg. Co.
General Cable Corp.
International Electronic Research Corp.
Magnetic Shield Div.-Perfection Mica Co.
Newark Wire Cloth Co.
Paul & Beekman, Inc.
Shielding Inc.

Transformer

Magnetic Shield Div.-Perfection Mica Co.
Suffolk Products Corp.
Swedlow Plastics Co.
United Transformer Corp.

Tube

American Brass Co., The
Connector Corp.
Elco Corp.
Gasket, Packing & Specialty Co. Inc.
General Cable Corp.
International Electronic Research Corp.
Paul & Beekman, Inc.
Suffolk Products Corp.

SHIMS, LAMINATED

*LAMINATED SHIM CO.

SHUNTS, METER

Associated Research, Inc.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Hickok Electrical Instrument Co., The
Janco Corp.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Narda Microwave Corp., The
Simpson Electric Co.
Wacline, Inc.
*WESTINGHOUSE ELECTRIC CORP.

SHUTTERS, MICROWAVE

Airtron, Inc.
Bogart Mfg. Corp.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Omega Labs., Inc.
Ryan Aeronautical Co.
*TELERAD MFG. CORP.
Uniwave, Inc.
Waveline, Inc.

SLIDES

Chassis-Trak, Inc.

SOLDER

Acurate Specialties Co. Inc.
All-State Welding Alloys Co., Inc.
Alpha Metals, Inc.
American Brazing Alloys Co.
Anchor Metal Co. Inc.
Bow Solder Products Co., Inc.
Dalweld Co. Inc.
Division Lead Co.
General Findings & Supply Co., Industrial Div.
Handy & Harman
Johnson Mfg. Co., Inc.
Leach & Garner Co., Industrial Div.
New York Solder Co., Inc.
Spincraft, Inc.
Standard Metals Corp.
Tricon Mfg. Co.

SPRINGS, ANTENNA TENSION

W. L. Barrett Co., The
Birnbach Radio Co., Inc.
Cleveland Pneumatic Tool Co., The, Div.-Cleveland Pneumatic Industries, Inc.
Leetronics, Inc.
Newcomb Spring of Conn. Inc.
Robins Industries Corp.
Wind Turbine Co.

SPRINGS, GROUNDING ANTENNA

Ace Spring Mfg. Co., Inc.
W. L. Barrett Co., The
Birnbach Radio Co., Inc.
Blaco Mfg. Co.
H. Braun Tool & Instrument Co., Inc.
Leetronics, Inc.
Newcomb Spring of Conn. Inc.
Permax Products Div., Chisholm-Ryder Co., Inc.
Reliable Spring & Wire Forms Co., The

STANDARDS

Allegany Instrument Co., Inc.
Barnes Development Co.
Boonton Radio Corp.
Varo Mfg. Co.

Capacitance

Barnes Development Co.
Boonton Electronics Corp.
Consolidated Airborne Systems, Inc.
Leeds & Northrup Co.

Frequency

Demornay-Bonardi
Dunlap Electronics, Inc.
Gertsch Products Inc.
Manson Laboratories, Inc.
Telechrome Mfg. Corp.
Thompson Products, Inc.
Varo Mfg. Co.

Inductance

Leeds & Northrup Co.
United Transformer Corp.

Laboratory Time

Allegany Instrument Co., Inc.
Dunlap Electronics, Inc.
Hamilton Watch Co., Military Products Div.
Textran Corp.

Phase

Acton Laboratories Inc.
Barnes Development Co.
Theta Instrument Corp.
Varo Mfg. Co.
Wintronics

Resistance

Barnes Development Co.
Consolidated Airborne Systems, Inc.
General Electric Co., Apparatus Sales Div.
Gray Instrument Co.
Leeds & Northrup Co.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Narda Microwave Corp., The

STANDS, WAVEGUIDE

ACF Industries, Inc., Advanced Products Div.
Aircom Inc.
Ballymore Co.
C. B. Christiansen Co.
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
La Pointe Industries Inc.
Omega Labs., Inc.
Uniwave, Inc.
Waveline, Inc.
Winder Aircraft Corp. of Fla.

STATIC ELIMINATORS

Blaco Mfg. Co.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Merix Chemical Co.
Statikil, Inc., Div.-The J. E. Doyle Co.
United States Radium Corp.

STATORS, MOTOR & GENERATOR

Celco-Constantine Engrg. Laboratories Co.
Eicor Div.-F. L. Jacobs Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Kurz & Root Co.
Wacline, Inc.

STRIPS, MOUNTING

Birnbach Radio Co., Inc.
Blaco Mfg. Co.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electronic Techniques, Inc.
Kulka Electric Corp.

SUBMINIATURIZATION SERVICES

Advance Industries, Inc.
American Electronics, Inc.
*COOPER DEVELOPMENT CORP.
Daven Co., The
Dyer Engrg. Co., Inc.
Elgin Micronics, West Coast Div.-Elgin National Watch Co.
Exact Engrg. & Mfg. Inc.
Haller Raymond & Brown Inc.
Hamilton Watch Co., Military Products Div.
Instrument Development Laboratories, Inc.
La Pointe Industries Inc.
Maico Electronics, Inc.
Mechanical Div.-General Mills, Inc.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITH & MFG. CO.
Motorola Inc., Military Marketing Div.
Resdel Engrg. Corp.
Telechrome Mfg. Corp.
Topper Mfg. Co., Inc.

SUPPRESSORS, NOISE

Hallett Mfg. Co.
Televiso Corp.

SWITCH GUARDS

Cutler-Hammer Inc.
Grimes Mfg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.

SWITCH, INERTIA

*INERTIA SWITCH DIV., SAFE LIGHTING INC.

SWITCHES

Airtron, Inc.
Amatom Electronic Hardware Co. Inc.
Automatic Electric Sales Corp.
Birnbach Radio Co., Inc.
Bogart Mfg. Corp.
Capitol Machine Co., The
Carling Electric, Inc.
James Cunningham Son & Co., Inc.
Cutler-Hammer Inc.
Daven Co., The
Ebert Electronics Corp.
Electro Tec Corp.
Electro-Miniatures Corp.
Electro-Tech Equipment Co.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Gordos Corp.
Kulka Electric Corp.
Licon & Spiroid Divs., Illinois Tool Works
P. R. Mallory & Co. Inc.
Metals & Controls Corp.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
*MISSILE COMPONENTS GROUP, ELECTRO-SNAP SWITCH & MFG. CO.
Mycalex Corp. of America
Network Mfg. Corp.
O & S Research, Inc.
Philadelphia Scientific Glass Co.
Recora Co., Inc., The
Richards Electrocraft, Inc.
Switchcraft, Inc.
Ucinite Co., The, Div.—United-Carr Fastener Corp.
Universal Circuit Controls Corp.
*WESTINGHOUSE ELECTRIC CORP.

SWITCHING EQUIPMENT, ANTENNA

Airtron, Inc.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
James Cunningham Son & Co., Inc.
Hycon Eastern Inc.
E. F. Johnson Co.
La Pointe Industries Inc.
Micro Switch, Div.—Minneapolis-Honeywell Reg. Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Telectro Industries Corp.
Wind Turbine Co.
Winder Aircraft Corp. of Fla.

SYNCHROS

Cilfton Precision Products Co., Inc.

TAPE

Arno Adhesive Tapes, Inc.
Audio-Master Corp.
Bonny Mfg. Corp.
Chart-Pak, Inc.
Connecticut Hard Rubber Co., The
C. R. Daniels, Inc.
Enflo Corp.
Hamilton Watch Co., Military Products Div.
Joclin Mfg. Co.
Master Tape Printers
Raybestos-Manhattan, Inc.
Silicones Div.-Union Carbide Corp.
Sparta Mfg. Co.
Westline Products Div., Western Lithograph Co.

TAPES, RECORDING

Audio-Master Carp.
Hamilton Watch Co., Military Products Div.
Minneapolis-Honeywell Regulator Co., Indust. Div.
Paper Mfgrs. Co.
Soroban Engrg., Inc.
Southwestern Industrial Electronics Co.

TARGET DEVICES

(Infra-red, radar)
*COOPER DEVELOPMENT CORP.

TERMINAL BLOCKS

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
Automatic Electric Sales Corp.
B G Corp., The
Burndy Corp., Omaton Div.
Cal-Ohm Labs., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electric Auto-Lite Co., The
Electronic Techniques, Inc.
Electro-Tech Equipment Co.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Components Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Gunnar Laboratories
Helipot Corp.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Jodee Plastics Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kasar Mfg. & Distributing Co., Inc.
Kolton Electric Mfg. Co.
Kulka Electric Corp.
La Pointe Industries Inc.
Litton Industries, Components Div.
Molding Corp. of America
Pic Design Corp., Sub.—Benrus Watch Co., Inc.
St. Regis Paper Co.
Silicone Insulation, Inc.
Superior Carbon Products, Inc.
Tensor Electric Development Co., Inc.

TERMINAL BOARDS

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
B G Corp., The
Cal-Ohm Labs., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Dalmore Corp.
Electric Auto-Lite Co., The
Electronic Techniques, Inc.
Elm Mfg. Co. Inc.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Components Inc.
General Railway Signal Co.
Gunnar Laboratories
Hobson Brothers, Inc.
Walter K. Jaros, Aircrafters
Jodee Plastics Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kasar Mfg. & Distributing Co., Inc.
Keystone Electronics Corp.
Kulka Electric Corp.
La Pointe Industries Inc.
Litton Industries, Components Div.
Methode Mfg. Corp.
Molding Corp. of America
St. Regis Paper Co.
Silicone Insulation, Inc.
Tensor Electric Development Co., Inc.
Tri-Dex Co.
Vector Electronic Co.

TERMINAL LUG SWAGGERS

Amp Inc.
Burndy Corp., Omaton Div.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electronic Techniques, Inc.
General Components Inc.
Walter K. Jaros, Aircrafters
Keystone Electronics Corp.
Kulka Electric Corp.
Litton Industries, Components Div.
Tensor Electric Development Co., Inc.

TERMINAL STRIPS

Accurate Electronics Corp., Dept D
Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
Automatic Electric Sales Corp.
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Cal-Ohm Labs., Inc.
Continental Diamond Fibre Corp., Sub.—The Budd Co.
Electronic Techniques, Inc.
Elm Mfg. Co. Inc.
Emerson Plastics Corp.
Enflo Corp.
Garde Mfg. Co.
General Components Inc.
General Railway Signal Co.
Gunnar Laboratories
Industrial Engravers Inc.
Jodee Plastics Co.
Howard B. Jones Div.-Cinch Mfg. Corp.
Kasar Mfg. & Distributing Co., Inc.
Kulka Electric Corp.
Litton Industries, Components Div.
Molding Corp. of America
North Electric Co.
Silicone Insulation, Inc.
Techniques, Inc.
Tri-Dex Co.
Vector Electronic Co.
Waldom Electronics Inc.

TERMINALS

Amp Inc.
Accurate Electronics Corp., Dept D

. . . tracking & telemetering

Aerolite Electronics Corp.
Alden Products Co.
Amatom Electronic Hardware Co. Inc.
American Brass Co., The
B G Corp., The
Birnbach Radio Co., Inc.
Burndy Corp., Omaton Div.
Cal-Ohm Labs., Inc.
Circon Component Corp.
Dalmore Corp.
Dejur-Amsco Corp.
Electric Auto-Lite Co., The
Electrical Industries, Div.-Philips Electronics, Inc.
Electronic Techniques, Inc.
Enflo Corp.
Garde Mfg. Co.
General Ceramics Corp.
General Components Inc.
General Railway Signal Co.
Goe Engrg. Co.
Hallett Mfg. Co.
Walter K. Jaros, Aircrafters
Joclin Mfg. Co.
Keystone Electronics Corp.
Kulka Electric Corp.
Litton Industries, Components Div.
Lundy Associates Inc.
Malco Tool & Mfg. Co.
Molding Corp. of America
Chester Morton Electronics Corp.
Thermo Materials, Inc.
Vector Electronic Co.
Vemaline Products Co.
Waldom Electronics Inc.
Winchester Electronics, Inc.

TERMINATIONS

Amp Inc.
Bogart Mfg. Corp.
General Ceramics Corp.
Lundy Associates Inc.
Microwave Electronics Div. Sperry Gyroscope Co.
Wacline, Inc.

TRANSDUCERS

Advance Industries, Inc.
Allegany Instrument Co., Inc.
***R. C. ALLEN BUSINESS MACHINES, INC., AIRCRAFT INSTRUMENTS DIV.**
American Electronics, Inc.
Atlantic Research Corp.
B & F Instruments, Inc.
BJ Electronics, Borg-Warner Corp.
Baldwin-Lima-Hamilton Corp., Electronics & Instrumentation Divs.
Cardinal Instrumentation Corp.
Chesapeake Instrument Corp.
Cleveland Instrument Co.
Coil Co. of America
G. L. Collins Corp.
Computer Instruments Corp.
Consolidated Electrodynamics Corp.
Crescent Engrg. & Research Co.
Datran Electronics, Div.—Mid-Continent Mfg., Inc.
Dynac, Inc.
Dynametrics Corp.
Eaton Mfg. Co., Inc., Fredric Flader Div.
Edcliff Instruments
Electro Products Labs., Inc.
Electronic Processes Corp. of California
Endevco Corp.
Fairchild Controls Corp., Components Div.
Fenwal Inc.
Friez Instrument Div.-Bendix Aviation Corp.
Gates Electronic Co.
Gudeman Co., The
Haller Raymond & Brown Inc.
Kollsman Instrument Corp., Sub.—Standard Coil Products Co. Inc.
***WALLACE O. LEONARD, INC.**
Marco Electronics, Inc.
Massa Labs., Inc.
Minatron Corp.
Narda Ultrasonics Corp., The
Perkin-Elmer Corp.
Photocon Research Products
Roflan Co., The
Southwestern Industrial Electronics Co.
Trans-Sonics, Inc.
U. S. Gauge Div.-American Machine & Metals, Inc.
Vap-Air Div., Vapor Heating Corp.

TRANSFORMERS

Acme Electric Corp.
Acro Products Co.
Advance Industries, Inc.
Airtron, Inc.
Ballastran Corp.
Bogue Electric Mfg. Co.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Davenport Mfg. Co.
Del Electronics Corp.
ECS Corp.
Eisler Engrg. Co., Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Epco Products Inc.
Ferranti Electric Inc.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Hevi-Duty Electric Co.
Highland Engrg. Co.
***INTERELECTRONICS CORP.**
Lenkurt Electric Co., Inc.
Mara Electronics, Inc.
McKenna Labs.
Microtran Co. Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
North Hills Electric Co., Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Sangamo Electric Co.
Servomechanisms, Inc.
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Superex Electronics Corp.
Tensor Electric Development Co., Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Co., Inc.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

Audio

Acro Products Co.
Advance Industries, Inc.
Alto Scientific Co., Inc.
Ballastran Corp.
Burnell & Co., Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Electrical Windings, Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Epco Products Inc.
Ferranti Electric Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
Highland Engrg. Co.
***INTERELECTRONICS CORP.**
Lenkurt Electric Co., Inc.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Sangamo Electric Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Superex Electronics Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

Fly Back

Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Chicago Standard Transformer Corp.
Coil Co. of America
Gulton Industries, Inc.
Mara Electronics, Inc.
J. J. Monaghan Co., Inc.
Osborne Electronic Sales Corp.
Penn-Tran Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Triad Transformer Corp.
Varo Mfg. Co.
Wright Zimmerman, Inc.

Foil Wound

Ballastran Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Coil Co. of America
Del Electronics Corp.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
Highland Engrg. Co.
Johnson Electronics Ins.
J. J. Monaghan Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Sterling Transformer Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.

General

Acme Electric Corp.
Ballastran Corp.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Del Electronics Corp.
Electrical Windings, Inc.
Electro Engrg. Works
Epco Products Inc.
Ferranti Electric Inc.
General Electric Co., Apparatus Sales Div.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Gulton Industries, Inc.
Hevi-Duty Electric Co.
Highland Engrg. Co.
Hindle Transformer Co. Inc.
A. F. Holden Co., The
***INTERELECTRONICS CORP.**
Lindberg Engrg. Co.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

High Voltage Power Supply

Airtron, Inc.
Ballastran Corp.
Bogue Electric Mfg. Co.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Del Electronics Corp.
ECS Corp.
Eisler Engrg. Co., Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Epco Products Inc.
Ferranti Electric Inc.
Fugle-Miller Labs Inc.
General Electric Co., Apparatus Sales Div.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Gulton Industries, Inc.
Hevi-Duty Electric Co.
Highland Engrg. Co.
Hindle Transformer Co. Inc.
***INTERELECTRONICS CORP.**
Laboratory for Electronics, Inc.
Lavoie Labs., Inc.
Microtran Co. Inc.
J. W. Miller Co.

J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Copr.
Peschel Electronics, Inc.
Ryan Aeronautical Co.
Sangamo Electric Co.
Saratoga Industries
Standard Transformer Co.
Southwest Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Instrument

Advance Industries, Inc.
Associated Research, Inc.
Ballastran Corp.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Coil Co. of America
Cycle Transformer Corp.
Davenport Mfg. Co.
Del Electronics Corp.
Electrical Windings, Inc.
Electro Engrg. Works
Electronics Corp. of America
Electrosolids Corp.
Fugle-Miller Labs Inc.
General Electric Co., Apparatus Sales Div.
Gulton Industries, Inc.
Hevi-Duty Electric Co.
***INTERELECTRONICS CORP.**
Johnson Electronics Inc.
Laboratory for Electronics, Inc.
Magnetico, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Quick Charge Corp.
Ryan Aeronautical Co.
Sangamo Electric Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Intermediate Frequency

Advance Industries, Inc.
Amelco, Inc.
Ballastran Corp.
Carad Corp.
Central Coil Co. Inc.
Coil Co. of America
Electronic Transformer Co., Inc.
Fugle-Miller Labs Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
***INTERELECTRONICS CORP.**
Johnson Electronics Inc.
Laboratory for Electronics, Inc.
Lenkurt Electric Co., Inc.
J. W. Miller Co.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Osborne Electronic Sales Corp.
Radio Industries, Inc.
Redman Electronics Corp.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Superex Electronics Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Miniature

Acme Electric Corp.
Advance Industries, Inc.
Airtron, Inc.
Ballastran Corp.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Contral Transformer Co.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Del Electronics Corp.
ECS Corp.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Electronics Corp. of America
Ferranti Electric Inc.
Fugle-Miller Labs Inc.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Gulton Industries, Inc.
Hevi-Duty Electric Co.
Highland Engrg. Co.
***INTERELECTRONICS CORP.**
Johnson Electronics Inc.
Laboratory for Electronics, Inc.
Lenkurt Electric Co., Inc.
Magnetico, Inc.
Mara Electronics, Inc.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
New York Transformer Co. Inc.
North Hills Electric Co., Inc.
Osborne Electronic Sales Corp.
Pulse Engrg. Inc.
Radio Industries, Inc.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Sterling Transformer Corp.
Superex Electronics Corp.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Vibration Research Labs., Inc.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Output

Acro Products Co.
Advance Industries, Inc.
Airtron, Inc.
Ballastran Corp.
Bogue Electric Mfg. Co.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Del Electronics Corp.
Eisler Engrg. Co., Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Epco Products Inc.
Ferranti Electric Inc.
Goslin Electric & Mfg. Co.
Guided Missile Div.-De Havilland Aircraft of Canada, Ltd.
Gulton Industries, Inc.
Hevi-Duty Electric Co.
Highland Engrg. Co.
Hindle Transformer Co. Inc.
***INTERELECTRONICS CORP.**
Laboratory for Electronics, Inc.
Lavoie Labs., Inc.
Magnetico, Inc.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Power

Acme Electric Corp.
Acro Products Co.
Advance Industries, Inc.
Airtron, Inc.
Ballastran Corp.
Bogue Electric Mfg. Co.
Celco-Constantine Engrg. Laboratories Co.
Central Coil Co. Inc.
Central Transformer Co.
Chicago Electronic Engrg. Co., Inc.
Chicago Standard Transformer Corp.
Coil Co. of America
Cycle Transformer Corp.
Del Electronics Corp.
Ebert Electronics Corp.
Eisler Engrg. Co., Inc.
Electro Engrg. Works
Electronic Transformer Co., Inc.
Epco Products Inc.
Ferranti Electric Inc.
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Green Rectifier Co.
Gulton Industries, Inc.
Hevi-Duty Electric Co.
Highland Engrg. Co.
Hindle Transformer Co. Inc.
***INTERELECTRONICS CORP.**
Laboratory for Electronics, Inc.
Lavoie Labs., Inc.
Magnetico, Inc.
Mara Electronics, Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
Multi-Amp Corp.
Munston Mfg. & Service, Inc.
NYT Electronics, Inc.
National Coil Co.
New York Coil Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Superior Electric Co., The
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Tresco, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.

Precision Voltage Dividing

Airtron, Inc.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Coil Co. of America
Cycle Transformer Corp.
Del Electronics Corp.
Gertsch Products Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
***INTERELECTRONICS CORP.**
Laboratory for Electronics, Inc.
Microtran Co. Inc.
J. J Monaghan Co., Inc.
New York Transformer Co. Inc.
Osborne Electronic Sales Corp.
Quick Charge Corp.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.

Pulse

Acme Electric Corp.
Acro Products Co.
Advance Industries, Inc.
Airtron, Inc.
Alto Scientific Co., Inc.
Ballastran Corp.
Carad Corp.
Celco-Constantine Engrg. Laboratories Co.
Chicago Standard Transformer Corp.
Cycle Transformer Corp.
Digitronics Corp.
ECS Corp.
Eisler Engrg. Co., Inc.
Electronic Transformer Co., Inc.
Epco Products Inc.
Filtron Co., Inc.
Fugle-Miller Labs Inc.
Goslin Electric & Mfg. Co.

. . . tracking & telemetering

Gulton Industries Inc.
Hevi-Duty Electric Co.
Johnson Electronics Inc.
Laboratory for Electronics Inc.
Lavoie Labs., Inc.
Microtran Co. Inc.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
New York Transformer Co. Inc.
Orbitran Co., Inc.
Osborne Electronic Sales Corp.
Pulse Engrg., Inc.
Ryan Aeronautical Co.
Saratoga Industries
Southwestern Industrial Electronics Co.
Technitrol Engrg. Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
Triad Transformer Corp.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.—Sperry Rand Corp.
Wright Zimmerman, Inc.

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Airtron, Inc.
Carad Corp.
Fugle-Miller Labs Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
Johnson Electronics Inc.
Laboratory for Electronics, Inc.
J. W. Miller Co.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
National Coil Co.
North Hills Electric Co., Inc.
Osborne Electronic Sales Corp.
Redman Electronics Corp.
Ryan Aeronautical Co.
Sioux Radio Products
Southwestern Industrial Electronics Co.
Superex Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Vanguard Electronics Co.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wheeler Electronic Corp., Sub.-Sperry Rand Corp.
Wright Zimmerman, Inc.

Ultrasonic

Acoustica Associates, Inc.
Acro Products Co.
Ballastran Corp.
Celco-Constantine Engrg. Laboratories Co.
Central Transformer Co.
Cycle Transformer Corp.
Electronic Transformer Co., Inc.
Epco Products Inc.
Ferranti Electric Inc.
Goslin Electric & Mfg. Co.
Gulton Industries, Inc.
***INTERELECTRONICS CORP.**
McKenna Labs.
J. J. Monaghan Co., Inc.
NYT Electronics, Inc.
Narda Ultrasonics Corp., The
New York Transformer Co. Inc.
North Hills Electric Co., Inc.
Osborne Electronic Sales Corp.
Ryan Aeronautical Co.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tensor Electric Development Co., Inc.
Terminal Radio Corp.
Transformers, Inc.
Transonic, Inc.
United Transformer Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.

TRANSCEIVERS

Aeronautical Electronics, Inc.
American Electronics, Inc.
Bendix Aviation Corp., York Div.
Collins Radio Co.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Lear, Inc.
Magnavox Co., The
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
Production Research Corp.
***RESEARCH & ADVANCED DEVELOPMENT DIV., AVCO MFG. CORP.**
Seeburg Corp., The
Simmonds Aerocessories, Inc.
Stewart-Warner Corp.
Stromberg-Carlson, Electronics Div.
Telectro Industries Corp.
Terminal Radio Corp.
Varo Mfg. Co.
Warren Transformer Co., Inc.
Westronics Inc.
Wunderlich Radio Co.

TRANSISTOR ANALYZERS

American Electronics, Inc.
Baird-Atomic, Inc.
Alfred W. Barber Labs.
Barnes Development Co.
Consolidated Avionics Corp.
Haller Raymond & Brown Inc.
Kay Electric Co.
Owen Labs., Inc.
Ryan Aeronautical Co.
Telectro Industries Corp.
Terminal Radio Corp.
Ultradyne, Inc.

TRANSISTORS

Bendix Aviation Corp., Red Bank Div.
Bogue Electric Mfg. Co.
CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Clevite Transistor Products, Div.-Clevite Corp.
General Transistor Corp.
Haller Raymond & Brown Inc.
R. I. Metpro, Inc.
Motorola Inc., Military Marketing Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Junction

CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Clevite Transistor Products, Div.-Clevite Corp.
General Transistor Corp.
Motorola Inc., Military Marketing Div.
Motorola Semiconductor Products Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Photo

Clevite Transistor Products, Div.-Clevite Corp.
General Transistor Corp.
Terminal Radio Corp.

Point-Contact

CBS-Hytron, Div.—Columbia Broadcasting System, Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Power

Bogue Electric Mfg. Co.
CBS-Hytron, Div.—Columbia Broadcasting System, Inc.
Gates Electronic Co.
Motorola Inc., Military Marketing Div.
Motorola Semiconductor Products Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

Selenium

Motorola Inc., Military Marketing Div.
Terminal Radio Corp.

Surface Barrier

Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Switching

Bendix Aviation Corp., Red Bank Div.
CBS-Hytron, Div.—Columbia Broadcasting System, Inc.
General Transistor Corp.
Helipot Corp.
Motorola Inc., Military Marketing Div.
Motorola Semiconductor Products Div.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Tetrode

Terminal Radio Corp.
***WESTINGHOUSE ELECTRIC CORP.**

TRANSMITTERS

Acoustica Associates, Inc.
Advance Industries, Inc.
Aircraft Armaments, Inc.
Amelco, Inc.
Collins Radio Co.
Communications Co.
Cubic Corp.
Du Kane Corp.
Electronic Communications, Inc.
Electronics Development Co., Inc.
General Electronic Labs., Inc.
General Railway Signal Co.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
E. F. Johnson Co.
Lane Electronics Mfg. Corp.
Manson Laboratories, Inc.
Motorola Inc., Military Marketing Div.
Munston Mfg. & Service, Inc.
National Electronics Laboratories, Inc.
Pacific Div.-Bendix Aviation Corp.
Ralph M. Parsons Co., The, Electronics Div.
***RADIATION, INC.**
Reeves Instrument Corp.
Republic Aviation Corp., Guided Missile Div.
Resdel Engrg. Corp.
Ryan Aeronautical Co.
Sarkes Tarzian, Inc.
Seeburg Corp., The
Skiatron Electronics & Television Corp.
Stavid Engrg., Inc.
Stromberg-Carlson, Electronics Div.
Sylvania Electronic Systems, Div.-Sylvania Electric Products Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
***TELE-DYNAMICS INC.**
Terminal Radio Corp.
Varo Mfg. Co.
***WESTINGHOUSE ELECTRIC CORP.**
Wunderlich Radio Co.

TRANSPONDERS

Advance Industries, Inc.
Aircraft Armaments, Inc.
American Research & Mfg. Corp.
Bendix Aviation Corp., York Div.
Cubic Corp.
Haller Raymond & Brown Inc.
Hazeltine Electronics Div.-Hazeltine Corp.
Hoover Electronics Co.
Pacific Div.-Bendix Aviation Corp.
Resdel Engrg. Corp.
Skiatron Electronics & Television Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Westronics Inc.

TRAPS, WAVE

Telectro Industries Corp.
Terminal Radio Corp.

TUBE COOLING UNITS

Terminal Radio Corp.
***UNITED AIRCRAFT PRODUCTS, INC.**

TUBE PARTS

Beaton & Corbin Mfg. Co., The
Gasket, Packing & Specialty Co. Inc.
Hamilton Watch Co., Military Products Div.
Lancaster Glass Corp.
R. I. Metpro, Inc.
Sylvania Electric Products Inc., Parts Div.
Terminal Radio Corp.

TUBES

Burroughs Corp.
CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Central Electronic Mfgrs., Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Polarad Electronics Corp.
Sanders Associates, Inc.
Terminal Radio Corp.
United Electronics Co.

Atr

Bomac Laboratories, Inc.
Central Electronic Mfgrs., Inc.
Gates Electronic Co.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Backward Wave

Bendix Aviation Corp., Red Bank Div.
Demornay-Bonardi
Geisler Labs.
Huggins Labs., Inc.
Polarad Electronics Corp.
Terminal Radio Corp.
Wunderlich Radio Co.

Ballast

Gates Electronic Co.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Battery Charger

Christie Electric Corp.
General Electric Co., Apparatus Sales Div.
Gordos Corp.
Sel-Rex Corp.
Terminal Radio Corp.

Bolometer

Microwave Electronics Div., Sperry Gyroscope Co.
Terminal Radio Corp.

Cathode Ray Instrument Use

Barker Sales Co.
Edgerton, Germeshausen & Grier, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corps., Lansdale Tube Co. Div.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Cathode Ray, Multiple Gun

CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Du-Co Ceramics Co.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
National Union Electric Corp.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
***WESTINGHOUSE ELECTRIC CORP.**

Ceramic

American Lava Corp.
Bendix Aviation Corp., Red Bank Div.
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Electric Refractories Co., The
Geisler Labs.
Isolantite Mfg. Corp.
Terminal Radio Corp.

Computer, Storage

Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Skiatron Electronics & Television Corp.
Terminal Radio Corp.

Counter Beam

Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Terminal Radio Corp.

Electrometer

Barker Sales Co.
Terminal Radio Corp.

Electron Multiplier

Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
National Union Electric Corp.
Terminal Radio Corp.

Gamma Ray, Nuclear

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Geiger Counter, Nuclear

***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Geiger Mueller

***ANTON ELECTRONICS LABS., INC.**
Baird-Atomic Inc.
Instruments Div.-Philips Electronics, Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Glow or Discharge

Amglo Corp.
***ANTON ELECTRONIC LABS., INC.**
Baird-Atomic, Inc.
Burroughs Corp., Electronic Tube Div.
Edgerton, Germeshausen & Grier, Inc.
Gordos Corp.
Kemlite Laboratories, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Signalite Inc.
Terminal Radio Corp.
Veeco Vacuum Corp.

Ignitron

Beaton & Corbin Mfg. Co., The
Terminal Radio Corp.
Westinghouse Electric Corp.

Infrared

Central Electronic Mfgrs., Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Infrared Industries Inc.
Kemlite Laboratories, Inc.
Mackay Research Labs.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Ionization

Amglo Corp.
Central Electronic Mfgrs., Inc.
Geisler Labs.
Green Rectifier Co.
NRC Equipment Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.
Veeco Vacuum Corp.

Klystron

Bendix Aviation Corp., Red Bank Div.
Bomac Laboratories, Inc.
Demornay-Bonardi
Eitel-McCullough, Inc.
Geisler Labs.
Polarad Electronics Corp.
Ryan Aeronautical Co.
Terminal Radio Corp.

Magnetron

Bomac Laboratories, Inc.
Demornay-Bonardi
Mackay Research Labs.
Polarad Electronics Corp.
Terminal Radio Corp.
Westinghouse Electric Corp.

Miniature

CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Noise Source

Bomac Laboratories, Inc.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Central Electronic Mfgrs., Inc.
Demornay-Bonardi
Geisler Labs.
Nuclear Corp. of America, Inc.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Phototubes

Central Electronic Mfgrs., Inc.
Edgerton, Germeshausen & Grier, Inc.
Electron-Radar Products
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
General Electric Co., Apparatus Sales Div.
Gordos Corp.
Mackay Research Labs.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Terminal Radio Corp.

Phototubes, Multiplier

Farnsworth Electronics Co., Div.-Int'l Telephone & Telephone Corp.
Mackay Research Labs.
Terminal Radio Corp.

Pirani

NRC Equipment Corp.
Terminal Radio Corp.
Vacuum Tube Products Co., Inc.
Veeco Vacuum Corp.

Power Amplifier

Bendix Aviation Corp., Red Bank Div.
CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Penta Labs., Inc.
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Terminal Radio Corp.
United Electronics Co.
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Skiatron Electronics & Television Corp.
Terminal Radio Corp.

Receiving

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CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
National Union Electric Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
Westinghouse Electric Corp.

Rectifying, Gas Filled Type

Bendix Aviation Corp., Red Bank Div.
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Gordos Corp.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.
Westinghouse Electric Corp.

Rectifying, Transmitting

CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United Electronics Co.

Rectifying, Vacuum Type

Bendix Aviation Corp., Red Bank Div.
CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.
Westinghouse Electric Corp.

Scintillation

Baird-Atomic, Inc.
Farnsworth Electronics Co., Div.-Int'l Telephone & Telegraph Corp.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.

Scintillation, Nuclear

Baird-Atomic, Inc.
Nuclear Corp. of America, Inc.
Radiation Counter Labs., Inc.
Terminal Radio Corp.
Westinghouse Electric Corp.

Sparkgap

Bendix Aviation Corp., Red Bank Div.
Edgerton, Germeshausen & Grier, Inc.
Kemlite Laboratories, Inc.
Terminal Radio Corp.

Strobe

Amglo Corp.
Edgerton, Germeshausen & Grier, Inc.
Kemlite Laboratories, Inc.
Terminal Radio Corp.

Subminiature

Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.

Switching

Bendix Aviation Corp., Red Bank Div.
Burroughs Corp.
Burroughs Corp., Electronic Tube Div.
Central Electronic Mfgrs., Inc.
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.
United Electronics Co.

Thyratron

Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Mackay Research Labs.
Penta Labs, Inc.
Philco Corp., Government & Industrial Divs.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
Vacuum Tube Products Co. Inc.

Tr

Bomac Laboratories, Inc.
Central Electronic Mfgrs., Inc.
Nuclear Corp. of America, Inc.
Terminal Radio Corp.

Transducer

Terminal Radio Corp.

Transmitting

CBS-Hytron, Div.-Columbia Broadcasting System, Inc.
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Penta Labs, Inc.
Ryan Aeronautical Co.
Terminal Radio Corp.
United Electronic Co.
Westinghouse Electric Corp.
Wunderlich Radio Co.

Transmitting-Receiving

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United Electronics Co.
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Traveling Wave

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Bomac Laboratories, Inc.
Demornay-Bonardi
Edgerton, Germeshausen & Grier, Inc.
Eitel-McCullough, Inc.
Geisler Labs.
Huggins Labs., Inc.
Terminal Radio Corp.
United Electronics Co.

Ultra-Violet

Gordos Corp.
Kemlite Laboratories, Inc.
Menlo Research Lab.
Terminal Radio Corp.
Ultra-Violet Products, Inc.

Vacuum

Burroughs Corp., Electronic Tube Div.
Central Electronic Mfgrs., Inc.
Eitel-McCullough, Inc.
Mackay Research Labs.
National Union Electric Corp.
Nuclear Corp. of America, Inc.
Penta Labs, Inc.
Philco Corp., Lansdale Tube Co. Div.
Terminal Radio Corp.
United Electronics Co.
Vacuum Tube Products Co. Inc.
Westinghouse Electric Corp.

Voltage Reference or Regulating

*ANTON ELECTRONIC LABS., INC.
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National Union Electric Corp.
Philco Corp., Lansdale Tube Co. Div.
Signalite Inc.
Superior Electric Co., The
Terminal Radio Corp.

X-Ray

Bracke-Seib X-Ray Co., Inc.
Instruments Div.-Philips Electronics, Inc.
Mackay Research Labs.
Terminal Radio Corp.
Westinghouse Electric Corp.

TUBING, WAVEGUIDE

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Airtron, Inc.
Allied Research & Engrg., Div.-Allied Record Mfg. Co.
American Brass Co., The
Bendix Aviation Corp., York Div.
Chase Brass & Copper Co., Inc.
Continental Diamond Fibre Corp., Sub.-The Budd Co.
Co-Operative Industries, Inc.
Demornay-Bonardi
Engelhard Industries Inc., D. E. Makepeace Div.
J-V-M Microwave Co.
La Pointe Industries Inc.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
Standard Metals Corp.
Superior Tube Co.
Technical Oil Tool Corp.
*TELERAD MFG. CORP.
Tube Methods Inc.
Waveline, Inc.
Waveguide, Inc.

TUNERS

Amelco, Inc.
Bogart Mfg. Corp.
Browning Laboratories, Inc.
Diamond Antenna & Microwave Corp.
Electronic Communications, Inc.
P. R. Mallory & Co. Inc.
Narda Microwave Corp., The
Radio Condenser Co.
Terminal Radio Corp.

Automatic

Amelco, Inc.
Canoga Corp. of California
Electronic Communications, Inc.
P. R. Mallory & Co. Inc.
Polarad Electronics Corp.
Telectro Industries Corp.
Terminal Radio Corp.

f-m

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Browning Laboratories, Inc.
P. R. Mallory & Co. Inc.
J. W. Miller Co.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radio Condenser Co.
Herman Hosmer Scott, Inc.
Telechrome Mfg. Corp.
Telectro Industries Corp.
*TELE-DYNAMICS INC.
Terminal Radio Corp.

f-m & a-m

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Browning Laboratories, Inc.
Philco Corp., Government & Industrial Divs.
Polarad Electronics Corp.
Radio Condenser Co.
Herman Hosmer Scott, Inc.
Telectro Industries Corp.
Terminal Radio Corp.

Klystron

Aircom Inc.
Bendix Aviation Corp., York Div.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
J-V-M Microwave Co.
Polarad Electronics Corp.
Radar Design Corp.
Ryan Aeronautical Co.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.

Microwave

Aircom Inc.
Airtron, Inc.
Amelco, Inc.
Bendix Aviation Corp., York Div.
Bogart Mfg. Corp.
Canoga Corp. of California
*DALMO VICTOR CO., DIV.-TEXTRON INC.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Electronic Communications, Inc.
John Gombos Co., Inc.
J-V-M Microwave Co.
Microwave Electronics Div., Sperry Gyroscope Co.
Narda Microwave Corp., The
Polarad Electronics Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.
Uniwave, Inc.
Waveline, Inc.
Weinschel Engrg.

Permeability

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Radio Condenser Co.
Telectro Industries Corp.
Terminal Radio Corp.

Uhf

Aircom Inc.
Amelco, Inc.

Blonder-Tongue Labs., Inc.
Canoga Corp. of California
Electronic Communications, Inc.
J-V-M Mircowave Co.
L E L, Inc.
P. R. Mallory & Co. Inc.
Polarad Electronics Corp.
Radar Design Corp.
Sarkes Tarzian, Inc.
Telectro Industries Corp.
Terminal Radio Corp.
Weinschel Engrg.

TUNING DEVICES, RECEIVER MECHANICAL

Bowmar Instrument Corp.
Canoga Corp. of California
Collins Radio Co.
Haller Raymond & Brown Inc.
Hamilton Watch Co., Military Products Div.
P. R. Mallory Co.
Republic Aviation Corp., Guided Missiles Div.
Suffolk Products Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.

TUNING DEVICES, TRANSMITTER MECHANICAL

Bowmar Instrument Corp.
Canoga Corp. of California
Collins Radio Co.
***EASTERN INDUSTRIES, INC.**
Hamilton Watch Co., Military Products Div.
P. R. Mallory & Co. Inc.
Republic Aviation Corp., Guided Missile Div.
Suffolk Products Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.

TUNING UNITS, ANTENNA

Airtron, Inc.
Amelco, Inc.
Bowmar Instrument Corp.
Canoga Corp. of California
Collins Radio Co.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Diamond Antenna & Microwave Corp.
Haller Raymond & Brown Inc.
E. F. Johnson Co.
Lane Electronics Mfg. Corp.
La Pointe Industries Inc.
Microwave Electronics Div., Sperry Gyroscope Co.
Technical Appliance Corp.
Technical Oil Tool Corp.
Telectro Industries Corp.
Terminal Radio Corp.

VIBRATORS, INSTRUMENT PANEL

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Joe Davidson & Associates
Talley Corp., The
Terminal Radio Corp.
Vibration Research Labs., Inc.

VIBRATORS, MULTIVIBRATORS

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American Television & Radio Co.
Bendix Aviation Corp., York Div.
Erwood Inc.
Resdel Engrg. Corp.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Vibration Research Labs., Inc.

VIBRATORS, ULTRASONIC

Acoustica Associates, Inc.
Southwestern Industrial Electronics Co.
Terminal Radio Corp.

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Alto Scientific Co., Inc.
Bendix Aviation Corp., York Div.
Davenport Mfg. Co.
Epsco Inc.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Gerard G. Leeds Co., Inc.
***INTERELECTRONICS CORP.**
Owen Labs., Inc.
Southwestern Industrial Electronics Co.
Telectro Industries Corp.
Tel-Instrument Electronics Corp.
Terminal Radio Corp.
Varo Mfg. Co.

VOLTMETERS

Alto Scientific Co., Inc.
Assembly Products, Inc.
Ballantine Labs., Inc.
Consolidated Electrodynamics Corp.
Davenport Mfg. Co.
Electric Auto-Lite Co., The
Electric Design & Mfg. Co.
Electro Instruments, Inc.
Electro-Tech Equipment Co.
John Fluke Mfg. Co., Inc.
General Electric Co., Apparatus Sales Div.
Hammett Electric Co.
Helipot Corp.
Kay Electric Co.
Keithley Instruments, Inc.
Gerard G. Leeds Co., Inc.
Marion Electrical Instrument Co.
Meters Inc.
F. L. Moseley Co.
National Coil Co.
Non-Linear Systems Inc.
Phaostron Instrument & Electronic Co.
G. V. S. Inc.
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Southwestern Industrial Electronics Co.
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Terminal Radio Corp.
Wacline, Inc.
Waveforms, Inc.
***WESTINGHOUSE ELECTRIC CORP.**

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Terminal Radio Corp.
Tobe Deutschmann Corp.
Vanguard Electronics Co.

WAVEGUIDES

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Airtron, Inc.
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Bart Mfg. Corp.
Central Electronic Mfgrs., Inc.
Chemalloy Electronics Corp.
Co-Operative Industries, Inc.
***DALMO VICTOR CO., DIV.-TEXTRON INC.**
Joe Davidson & Associates
Defiance Engrg. & Microwave Corp.
Demornay-Bonardi
Diamond Antenna & Microwave Corp.
Douglas Microwave Co., Inc.
Electro Impulse Lab., Inc.
Engelhard Industries Inc., **D. E. Makepeace Div.**
Goodyear Aircraft Corp.
D. S. Kennedy & Co.
La Pointe Industries Inc.
Magnetic Shield Div.-Perfection Mica Co.
Metals & Controls Corp.
Nuclear Corp. of America, Inc.
Omega Labs., Inc.
Pacific Universal Products Corp.
Radar Design Corp.
Ryan Aeronautical Co.
Servicair Co.
Terminal Radio Corp.
Titeflex, Inc.
Transco Products, Inc.
Uniwave, Inc.
Wacline, Inc.
***WASHINGTON ALUMINUM CO., INC.**
Waveline, Inc.
Waveguide, Inc.
Westbury Electronics Inc.

WINDINGS, TRANSFORMER

Airtron, Inc.
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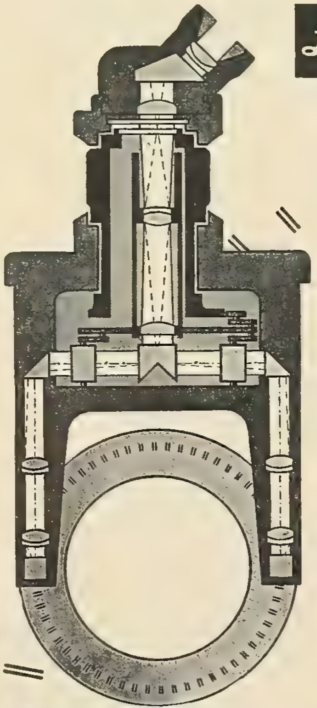
General Railway Signal Co.
Goslin Electric & Mfg. Co.
Highland Engrg. Co.
Johnson Electronics Inc.
Laboratory for Electronics, Inc.
Mara Electronics, Inc.
J. W. Miller Co.
Ram Electronics Inc.
Saratoga Industries
Southwestern Industrial Electronics Co.
Terminal Radio Corp.
Varo Mfg. Co.

WINDOWS, WAVEGUIDE

Coaxial Connector Co. Inc.
Continental Diamond Fibre Corp., **Sub.—The Budd Co.**
Demornay-Bonardi
Filmohm Corp.
***HAYWARD SCIENTIFIC GLASS CORP.**
D. S. Kennedy & Co.



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Waveline, Inc.

WIRE

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Ansonia Wire & Cable Co., The
Belden Mfg. Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Chase Brass & Copper Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
International Wire & Cable Co.
Jefferson Products Corp.
Jas. H. Matthews & Co.
Organic Development Corp., Spectra-Strip Div.
Plastoid Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Sanders Associates, Inc.
Sequoia Wire Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Thermax Wire Corp.
Topper Mfg. Co., Inc.
Warren Wire Co.
Western International Co.
Westwood Cable Corp.

Annunciator

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American Insulated Wire Corp.
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Birnbach Radio Co., Inc.
Calcon Mfg. Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
General Cable Corp.
***HUDSON WIRE CO.**
International Wire & Cable Co.
New England Electrical Works, Inc.
Normandy Electric Wire Corp.
Organic Development Corp., Spectra-Strip Div.
John A. Roeblings Sons Corp.
Royal Electric Corp.
Sequoia Wire Co.
Terminal Radio Corp.
Victor Electric Wire & Cable Corp.
Western International Co.
Westwood Cable Corp.

Antenna

Accurate Insulated Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Calcon Mfg. Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Copperweld Steel Co., Wire & Cable Div.
Don-Lan Electronics Co.
Electric Parts Corp.
General Cable Corp.
International Wire & Cable Co.
La Pointe Industries Inc.
New England Electrical Works, Inc.
Okonite Co., The
Plastoid Corp.
Rex Corp., The
John A. Roeblings Sons Corp.
Sequoia Wire Co.
Terminal Radio Corp.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western International Co.
Westwood Cable Corp.

Asbestos Insulated

American Insulated Wire Corp.
Boston Insulated Wire & Cable Co.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Essex Wire Corp.
General Cable Corp.
Lewis Engrg. Co., The
Okonite Co., The
Plastoid Corp.
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Royal Electric Corp.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Warren Wire Co.
Western Insulated Wire Co.
Western International Co.
Westwood Cable Corp.

Beryllium Copper

Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Terminal Radio Corp.
Westwood Cable Corp.

Ceramic Insulated

Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
General Cable Corp.
Secon Metals Corp.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Warren Wire Co.
Westwood Cable Corp.

Filament

Boston Insulated Wire & Cable Co.
Wilbur B. Driver Co.
Fansteel Metallurgical Corp.
Secon Metals Corp.
Terminal Radio Corp.

Gold Plated

Accurate Insulated Wire Corp.
Bios Labs., Inc.
Bram Metallurgical & Chemical Co.
Electric Auto-Lite Co., The
Elmet Div.-North American Philips Co., Inc.
Engelhard Industries Inc., D. E. Makepeace Div
International Wire & Cable Co.
Leach & Garner Co., Industrial Div.
Metals & Controls Corp.
J. M. Ney Co., The
Secon Metals Corp.
Terminal Radio Corp.

Harnesses

Accurate Insulated Wire Corp.
Alden Products Co.
Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Super-Temperature Wires, Inc.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Bliss Electronic Corp.
William Brand & Co., Inc.
Calcon Mfg. Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Elco Corp.
Electric Auto-Lite Co., The
Electric Parts Corp.
First Electronics Corp., The
Gray Mfg. Co., The
Hallett Mfg. Co.
International Wire & Cable Co.
Lewis Engrg. Co., The
J. E. Menaugh Co.
North Electric Co.
Organic Development Corp., Spectra-Strip Div
Packard Electric Div.-General Motors Corp.
Resdel Engrg. Corp.
Schaffer Air Industries, Inc.
Sittler Corp.
Surprenant Mfg. Co.
Terminal Radio Corp.
Titeflex, Inc.
Topper Mfg. Co., Inc.
Tri-Dex Co.
Tucson Instrument Corp.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western International Co.
Westwood Cable Corp.

High Voltage

Accurate Insulated Wire Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
Ansonia Wire & Cable Co., The
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
William Brand & Co., Inc.
Calcon Mfg. Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Electric Parts Corp.
Essex Wire Corp.
General Cable Corp.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
International Wire & Cable Co.
Jefferson Products Corp.
***NORMANDY ELECTRIC WIRE CORP.**
Okonite Co., The
Organic Development Corp., Spectra-Strip Div.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Sequoia Wire Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Times Wire & Cable Co., Inc.
Topper Mfg. Co., Inc.
Warren Wire Co.
Western Insulated Wire Co.
Western International Co.
Westwood Cable Corp.

Hook-Up

Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
William Brand & Co., Inc.
Calcon Mfg. Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Copperweld Steel Co., Wire & Cable Div.
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
Electric Parts Corp.
Essex Wire Corp.
General Cable Corp.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
Jefferson Products Corp.
Lewis Engrg. Co., The
Mohawk Wire & Cable Corp.
***NORMANDY ELECTRIC WIRE CORP.**
New England Electrical Works, Inc.
Okonite Co., The
Organic Development Corp., Spectra-Strip Div.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Rex Corp., The
Rockbestos Products Corp.
Rome Cable Corp.
Sanders Associates, Inc.
Sequoia Wire Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Topper Mfg. Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western Insulated Wire Co.
Western International Co.
Westwood Cable Corp.

Litz

American Super Temperature Wires Inc.
Barker Sales Co.
Belden Mfg. Co.
Calcon Mfg. Co., Inc.
Consolidated Wire & Associated Companies
General Cable Corp.
***HUDSON WIRE CO.**
New England Electrical Works, Inc.
Organic Development Corp., Spectra-Strip Div.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Westwood Cable Corp.

Magnet

Alpha Wire Corp.
American Super Temperature Wires Inc.
Barker Sales Co.
Belden Mfg. Co.
Birnbach Radio Co., Inc.
Calcon Mfg. Co., Inc.
Chase Brass & Copper Co., Inc.
Consolidated Wire & Associated Companies
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
Elmet Div.-North America Philips Co., Inc.
Essex Wire Corp.
Essex Wire Corp., Magnet Wire Div.
General Cable Corp.
Hitemp Wires, Inc.
New England Electrical Works, Inc.
Organic Development Corp., Spectra-Strip Div.
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Terminal Radio Corp.
Topper Mfg. Co., Inc.
Warren Wire Co.
Westwood Cable Corp.

Marking, Service

Ackerman Gould Co.
Alpha Wire Corp.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Calcon Mfg. Co., Inc.

Electric Auto-Lite Co., The
Hitemp Wires, Inc.
Manger Electric Co.
Jas. H. Matthews & Co.
Organic Development Corp., Spectra-Strip Div.
Teletronic Labs., Inc.
Terminal Radio Corp.
Warren Wire Co.
Westline Products Div., Western Lithograph Co.
Westwood Cable Corp.

Resistance & Filament

American Electric Cable Co.
Boston Insulated Wire & Cable Co.
Consolidated Wire & Associated Companies
Wilbur B. Driver Co.
Electric Parts Corp.
Magnetic Shield Div.-Perfection Mica Co.
J. M. Ney Co., The
Secon Metals Corp.
Terminal Radio Corp.

Shielded

Accurate Insulated Wire Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Insulated Wire Corp.
American Super Temperature Wires Inc.
Ansonia Wire & Cable Co., The
Barker Sales Co.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Birnbach Radio Co., Inc.
William Brand & Co., Inc.
Calcon Mfg. Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Co-Operative Industries, Inc.
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
Essex Wire Corp.
General Cable Corp.
Hallett Mfg. Co.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
International Wire & Cable Co.
Jefferson Products Corp.
Lewis Engrg. Co., The
Mohawk Wire & Cable Corp.
***NORMANDY ELECTRIC WIRE CORP.**
Okonite Co., The
Organic Development Corp., Spectra-Strip Div.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
Precision Tube Co., Inc.
Rex Corp., The
Rockbestos Products Corp.
John A. Roeblings Sons Corp.
Rome Cable Corp.
Royal Electric Corp.
Sequoia Wire Co.
Servicair Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Thermax Wire Corp.
Times Wire & Cable Co., Inc.
Topper Mfg. Co., Inc.
Victor Electric Wire & Cable Corp.
Warren Wire Co.
Western Insulated Wire Co.
Westwood Cable Corp.

Teflon Insulated

Allied Plastics Supply Corp.
Alpha Wire Corp.
American Electric Cable Co.
American Super Temperature Wires Inc.
Aristocrat Plastics, Inc.
Barker Sales Co.
Belden Mfg. Co.
Berkshire Electric Cable Co.
Bios Labs., Inc.
Birnbach Radio Co., Inc.
Boston Insulated Wire & Cable Co.
Calcon Mfg. Co., Inc.
Chester Cable Corp.
Consolidated Wire & Associated Companies
Electric Auto-Lite Co., The
Electric Auto-Lite Co., The, Wire & Cable Div.
General Cable Corp.
Hitemp Wires, Inc.
***HUDSON WIRE CO.**
International Wire & Cable Co.
Lewis Engrg. Co., The
***NORMANDY ELECTRIC WIRE CORP.**
Okonite Co., The
Organic Development Corp., Spectra-Strip Div.
Packard Electric Div.-General Motors Corp.
Plastoid Corp.
***HAROLD H. POWELL CO.**
Rex Corp., The
Rockbestos Products Corp.
Royal Electric Corp.
Sanders Associates, Inc.
Sequoia Wire Co.
Surprenant Mfg. Co.
Terminal Radio Corp.
Thermax Wire Corp.
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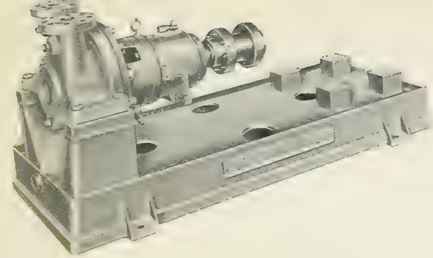

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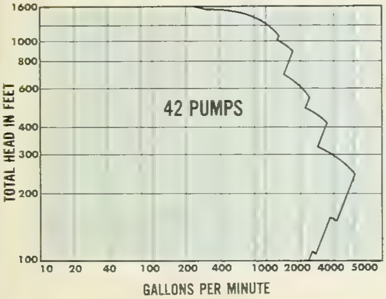
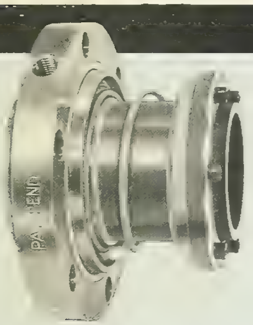
A horizontal process pump with BJ's Lo-Temp mechanical seal. Built in one or two stages with discharge pressures up to 500 psi and capacities to 5000 gpm. This pump has its own bearing bracket and is coupled to a standard motor. The SM Pump is suitable for either mobile or permanent installation and can be dismantled quickly and easily without disturbing suction or discharge piping for inspection or service.



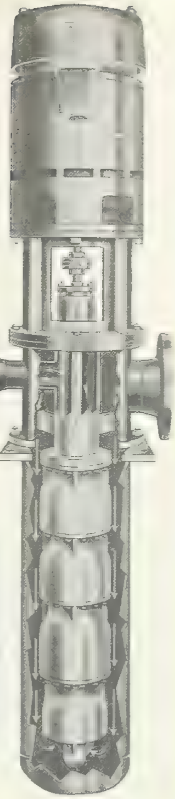


BJ DEVELOPS RELIABLE MECHANICAL SEAL AGAINST CRYOGENIC LIQUIDS

As a result of years of laboratory research and testing, Byron Jackson developed a reliable mechanical seal for cryogenic pump service that is as simple and easy to maintain as a standard industrial seal. The seal faces are replaceable . . . and all major components have a life expectancy that equals that of the pump. As an added safety feature, the seal has a built-in throttle bushing that will prevent hazardous leakage should a seal or bellows failure ever occur!

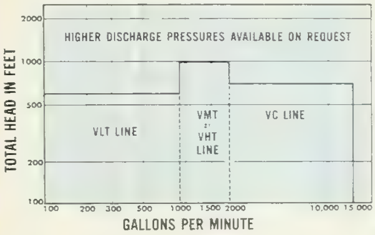
FEATURES OF THE BJ MECHANICAL SEAL . . .

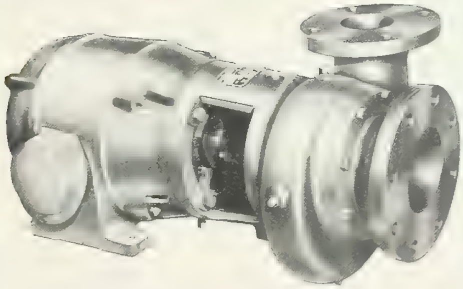
- Simple and easy to maintain
- Minimum leakage
- Long, trouble-free life
- Built-in throttle bushing for added safety
- Adaptable to many standard BJ Pump designs



VMT PUMPS

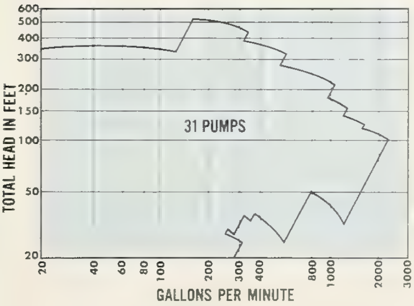
This vertical pump uses either the Lo-Temp mechanical seal or special BJ packing. When packing is used, the design utilizes a heat barrier converting (in the packing area) the cryogenic fluid to gas. Built in various numbers of stages, with capacities up to 15,000 gpm. Designed for moderate discharge pressures and where NPSH is a problem. VMT Pumps require the lowest suction pressures of any pump available.

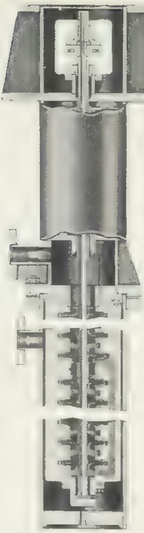




BILTON PUMPS

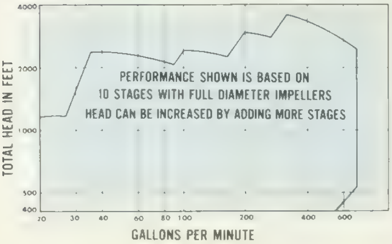
A self-contained horizontal motor-pump with Lo-Temp mechanical seal. Due to the close-coupled design and construction, Bilton Pumps are light and compact, require less space in mobile installations, are more economical, easier to maintain. Size is usually limited to 60 hp maximum.

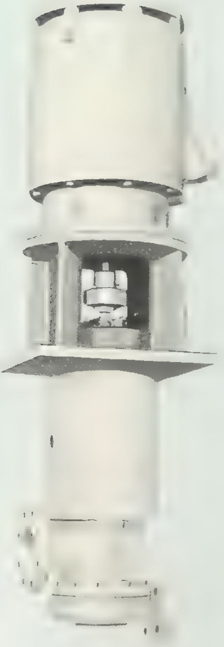




HYDROPRESS PUMPS

For extremely high pressures and efficiencies at low and moderate capacities, this vertical pump can be engineered with a minimum of four impellers and a maximum of 20 in series. Capacities are available to 650 gpm and pressures to 2000 psi. Available with Lo-Temp mechanical seal or heat barrier.





SPECIAL CRYOGENIC PUMPS

Pumping requirements for cryogenic fluids cannot always be met by the BJ standard line of Cryogenic Pumps due to chemical properties, toxicity, space limitations or other unusual conditions.

With such problems, Byron Jackson engineers will be glad to work with you to develop the pump for the job, and can place over three-quarters of a century of pump engineering knowledge at your disposal.

Thoroughly tested and qualified for CRYOGENIC service

Permanent Byron Jackson cryogenic pump test facility — used to improve the design of pumps and seals and to investigate the effect of suction pressure on pump cool down time.

Close-up of Mechanical Seal tester with cryogenic seal. This seal was developed to make standard BJ Process Pumps readily adaptable for pumping of low-temperature liquids.

Some of the BJ Cryogenic Pump customers

American Messer Corp.
Big Three Welding Supply
Canadian Industries Ltd.
Cambridge Corp.
Celanese Corp.
Corps of Engineers
(Cape Canaveral)
Dept. of Navy
Dow Chemical
Fluor Corp., Ltd.
Grace Chemical
Hayes Aircraft Corp.
H. L. Johnson Co.
L'Air Liquide
Liquid Carbonic Corp.
Mississippi River Chemical Corp.
Spencer Chemical
St. Paul Ammonia Products, Inc.
U.S. Air Force
Wall Cryogenics Inc.

COMPLETE INFORMATION
is now available . . . including specific performance data for the various lines of BJ Cryogenic Pumps. Write for Engineering Bulletin Section 1700.

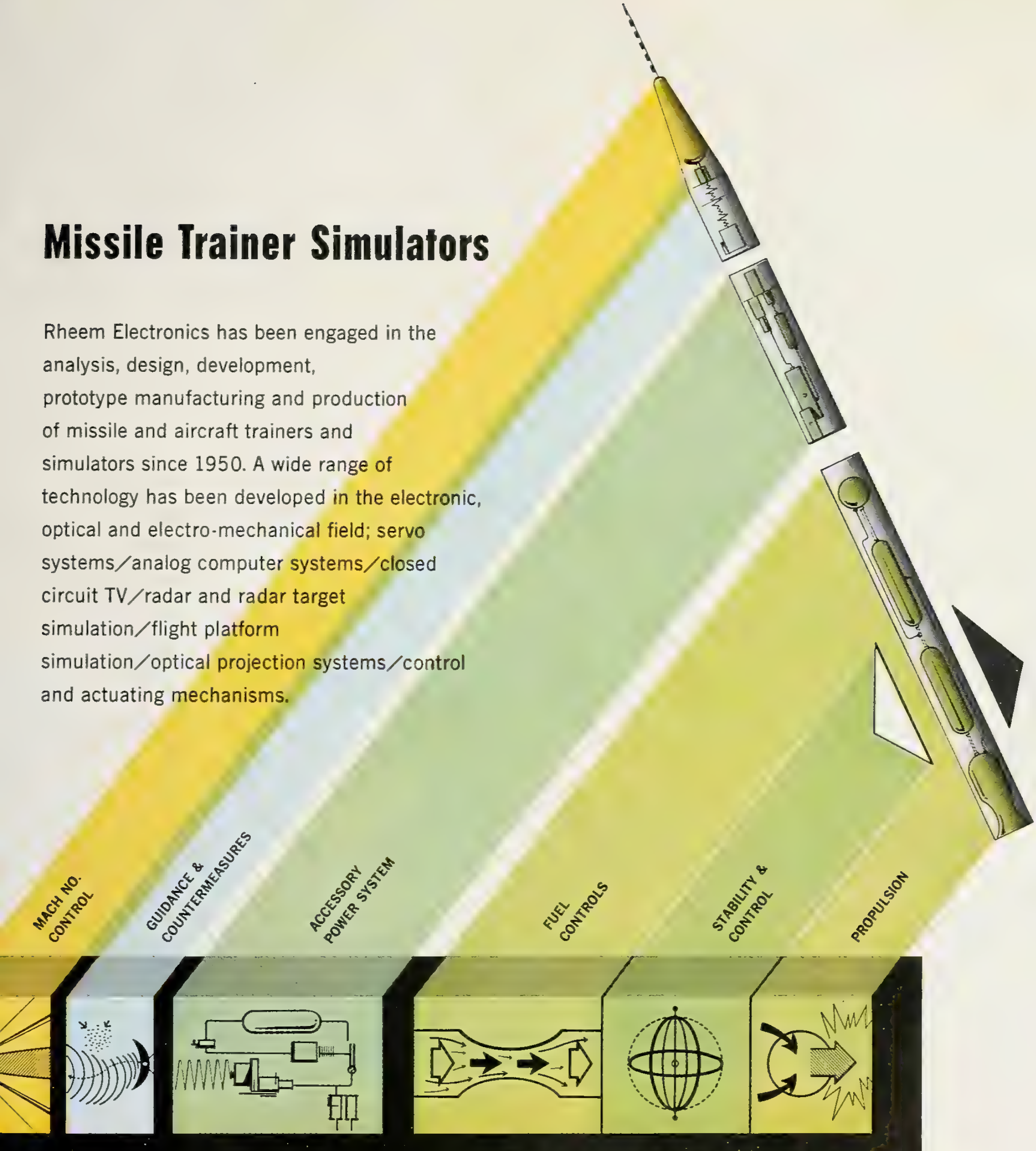
BJ
SINCE 1872

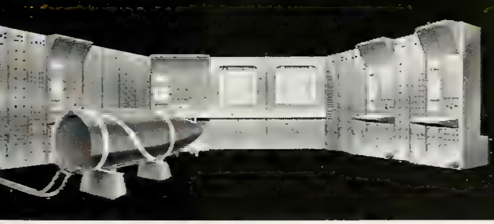
Byron Jackson Pumps, Inc.

A subsidiary of Borg-Warner Corporation
P.O. Box 2017A, Terminal Annex, Los Angeles 54, California

Missile Trainer Simulators

Rheem Electronics has been engaged in the analysis, design, development, prototype manufacturing and production of missile and aircraft trainers and simulators since 1950. A wide range of technology has been developed in the electronic, optical and electro-mechanical field; servo systems/analog computer systems/closed circuit TV/radar and radar target simulation/flight platform simulation/optical projection systems/control and actuating mechanisms.


MACH NO. CONTROL
GUIDANCE & COUNTERMEASURES
ACCESSORY POWER SYSTEM
FUEL CONTROLS
STABILITY & CONTROL
PROPULSION



The test console depicts a typical simulation device utilized for the "dry run" of a missile and its components; significant advances have been made in the art of simulation to train personnel in missile operations.

RHEEM MANUFACTURING COMPANY/ELECTRONICS DIVISION
Rivera, California

VANGUARD!

CONGRATULATIONS

Grand Central Rocket Co. congratulates the U. S. National Academy of Sciences, National Science Foundation, U. S. Naval Research Laboratory, The Martin Company, and all associated contractors and individuals who were affiliated with this outstanding contribution to the IGY program.

Because of demonstrated performance and reliability, one of Grand Central's solid propellant rocket engines was selected for the third stage of the VANGUARD vehicle, and was given the assignment of placing the satellite in orbit at a velocity of 18,000 mph. Grand Central Rocket Co. is honored to have played this prominent role in the VANGUARD project.

Grand Central
Rocket Co.
REDLANDS, CALIFORNIA

ENGINEERS AND SCIENTISTS:
Employment inquiries are invited.
Write Personnel Manager,
Box 111, Redlands, California.